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ABSTRACT

Based on findings of the Vocational Training and Placement of the Severely Handicapped Project (VOTAP), the handbook identifies major barriers preventing the severely handicapped from obtaining vocational training and employment, and includes a description of strategies that can be used to surmount these barriers. Initial sections cover use of the handbook; the clustering model for organizing potential employment areas; barriers to training and employment; and tables which identify attitudinal, communicational, environmental, and skills barriers with suggestions to overcome them. The bulk of the document contains 65 tables based on worker trait group information from a survey conducted as part of the VOTAP project. In each table are entries with information on the jobs that handicapped workers are now holding as revealed by the 169 VOTAP survey respondents, selected additional jobs in the same worker trait group, and the barriers that a handicapped person may face in securing training or placement. Among the 65 worker trait groups listed are art work, legal and related work, guidance and counseling, managerial work, and animal care. Also provided are lists of aids and devices, associations and committees, and programs, and a dictionary of occupational titles. (SBH)

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ED175229

Vocational Training and Placement of the Severely Handicapped

VOCATIONAL OPPORTUNITIES

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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This handbook makes frequent reference to job titles as they appear in the Dictionary of Occupational Titles (DOT). Many of these titles do not follow the current practice of using sexually neutral terms in naming jobs. For ease of reference to the DOT and because these references are direct citations to a published work, it was decided not to alter DOT terminology in the present document. This should not be taken to imply that the authors endorse the proposition that persons of one sex are better suited for some jobs than are persons of the other sex.

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The Vocational Training and Placement of the Severely Handicapped project was a comprehensive assessment effort involving the contributions of a large number of people, both AIR staff and a National Advisory Panel. The wide variety of contributions makes it difficult to accurately credit ideas, techniques, and suggestions to their originator

The members of the National Advisory Panel were most helpful in their advice, suggestions, and criticisms.

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Preface

THE NEED

The national conscience is becoming more sensitive to the fact that many segments of American society do not receive the benefits to which they are entitled. This heightened sensitivity has led to expanded efforts to help the handicapped participate in the social, economic, and cultural mainstream of this society.

Legislation and court decisions are slowly providing the handicapped with their full civil rights as guaranteed by the Constitution, including full access to education and vocational training. However, as these legal steps are taken, the public must acknowledge the need of all handicapped people to be treated as full-fledged human beings--no longer to be unnecessarily institutionalized, regarded as second-class citizens, or denied the full benefits of American life.

In the last decade, much progress has been made in preparing the handicapped for gainful employment. Two significant steps taken during this time were the specific funding of vocational training for the handicapped in the Vocational Education Amendments of 1968 and 1976. Supported by this legislation, a number of innovative and high-quality programs for the handicapped are now operating in local school districts and other agencies.

Another significant step in improving legislation was the passage in 1975 of the Education for All Handicapped Children Act (Public Law 94-142). This bill calls for massive expansion in authorized levels of the basic state grants program. The act has three major aspects: (1) it has no expiration date; (2) it makes a specific commitment to all handicapped children; and (3) it states that education must be extended to handicapped children as their fundamental right. The following are more specific implications of this legislation.

- Individualized educational programming is an essential component of appropriate education designed to meet the unique needs of handicapped children.
- To the maximum extent appropriate, handicapped children should receive education with children who are not handicapped; in other words, special classes, separate schooling, or any other removal of the handicapped from the regular educational environment should be reduced as much as possible.
- Adequate testing should be provided to ensure that student placement is not racially or culturally discriminatory. Testing will be conducted in the child's native language or mode of communication unless it is clearly not feasible to do so.

Adherence to the requirements of these implications will help eliminate the barriers currently facing severely handicapped persons as they try to find employment.

While progress is being made in helping those classified as handicapped to maximize their potential for self-fulfillment and for useful and meaningful participation in society, much more needs to be done to help the severely handicapped. "Severely handicapped" persons are those who because of the severity of their problems need educational, social, psychological, and medical services beyond those offered by traditional and special education programs. Severely handicapped persons are seriously emotionally disturbed, profoundly or severely mentally retarded, or multiply handicapped. Also in this category are persons with severe language deprivations, perceptual-cognitive deprivations, a fragile physiological condition, and/or a number of abnormal behaviors. Abnormal behaviors may include a failure to attend to pronounced social stimuli, self-mutilation, durable and intense temper tantrums, and the absence of rudimentary verbal control. The impairment of the severely handicapped is considered to be relatively permanent (U.S. Office of Education, Bureau of Education for the Handicapped, 1975).

THE PROJECT

The Bureau of Education for the Handicapped (BEH) of the U.S. Office of Education has outlined two principal objectives for improving the fortunes of the severely handicapped: first, ". . . to enable the most severely handicapped children and youth to become as independent as possible, thereby reducing their requirement for institutional care and providing opportunity for self-development;" second, ". . . to stimulate the initiation, expansion, and improvement of vocational education programs for the handicapped throughout the country in order to assure that every handicapped youth will have career education training which is relevant to the job market, meaningful to his career aspirations, and realistic to his fullest potential."

In July 1975 BEH contracted with the American Institutes for Research to investigate and assess the vocational training and employment possibilities of persons with severe permanent handicaps. The AIR project is called Vocational Training and Placement of the Severely Handicapped (VOTAP), and its purpose is to provide information that will help to increase the vocational education and employment opportunities for such individuals.

A National Advisory Panel was formed to provide policy orientation and technical direction to the project, and to obtain expert assistance concerning the general objectives of the project, the clientele it addresses, current and prospective training and placement methodologies, and products. The panelists were drawn from the vocational education, special education, and rehabilitation communities. The last section of this preface consists of a list of panel members.

Early in the project it became desirable to clarify that the focus of the VOTAP project was to be on vocational or occupational education rather than career education even though the BEH objective cited above implied that career education aspects should be considered. Vocational education and training in VOTAP was conceived of as education or training related to the occupational development of the severely handicapped, age 14 and beyond. This definition went beyond "vocational education" in the narrow sense of the term, which implies skills training with a trade orientation.

Although the programs to be studied by VOTAP were for students 14 years and up, it was apparent that severely handicapped persons are especially in need of occupational preparation before age 14, when prevocational training usually begins. For this reason, it was decided to include recommendations that may extend research and development activities down into the grade school and preschool years, but no attempt was made to deal with career education concerns in a comprehensive manner.

The specific objectives of the VOTAP project were to determine the following:

- What are the potential vocations for severely handicapped youth and adults?
- What vocational training programs are available for the severely handicapped?
- Do effective job placement programs exist? If so, where, and what services do they provide?
- What research and development activities might contribute to improved career/vocational education opportunities for the severely handicapped?

Project activities were to be conducted throughout with an eye to the dissemination and use of the resulting products. Appropriate education professionals were to be kept aware of the project and their assistance solicited as needed. The products resulting from the project were to be packaged in a form that facilitated their use.

The VOTAP project included five major activities. The first task was the preparation of an annotated bibliography of materials concerned with job placement of the severely handicapped.

The second task was to survey training and placement programs, to obtain descriptive data about them, and to identify particularly innovative or effective practices. Programs were selected from nominations according to geographic location, size, type of institution (public or private), and handicapping conditions of the clientele. Of the 333 programs surveyed, 169 programs responded. Guidelines for recognizing effective, innovative practices were drafted by the VOTAP project staff and were then reviewed by VOTAP's 13-member National Advisory Panel.

The third task was to prepare a handbook entitled Vocational Opportunities. This handbook identifies and discusses major barriers preventing the severely handicapped from obtaining vocational training and employment, and includes a description of strategies that can be used to surmount these barriers. The handbook contains lists of jobs obtained from the VOTAP survey that severely handicapped workers presently hold in sheltered workshops and competitive employment; it also contains suggestions as to how potential jobs may be opened to handicapped persons by managing relevant barriers.

The fourth task was to prepare a second handbook entitled Training Programs and Placement Services. This handbook contains one- to three-page descriptions of 152 programs. Innovative or effective practices are highlighted.

These practices were identified from survey returns and reviewed by using criteria drafted by the AIR research staff and critiqued by VOTAP's National Advisory Panel and by BEH.

The last major task was to prepare a monograph entitled *Research and Development Recommendations*. This monograph synthesizes the project findings and offers recommendations for further research and development in the area of vocational training and placement of the severely handicapped. These recommendations are based on needs identified during the course of the project and on suggestions made by the National Advisory Panel.

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Using This Handbook

PURPOSE

This handbook describes major barriers confronted by the severely handicapped person who attempts to obtain vocational training and eventual job placement. It also describes strategies for surmounting these barriers. These strategies may be used by the individual worker, by training and placement institutions, or by other advocates seeking to help the handicapped person attain his or her occupational goals.

This handbook identifies potential jobs and vocational areas for severely handicapped persons. First, it identifies jobs at which persons with severe handicaps have been successful. Then, using the Dictionary of Occupational Titles (DOT) system of classification, the handbook shows how potential jobs can be extrapolated by identifying jobs that have similar worker requirements. Suggestions are made for opening the way to new jobs by managing the barriers that handicapped workers face in obtaining and performing these jobs. The job and skill listings are not exhaustive; they are, however, representative of the achievements of handicapped persons.

This handbook is intended primarily for use by those who provide vocational training and job placement services for the severely handicapped or by those who train personnel who will be providing these services. The handbook will be useful in:

- identifying jobs that are suitable for sheltered workshops or for competitive employment situations;
- designing programs to train people in skills relevant to a wide range of jobs or to train them in background skills that will transfer to a range of more specific training programs;
- identifying job clusters that may be open for development to persons with certain types of handicaps; and
- providing information to handicapped persons themselves, to their parents, to personnel attempting "mainstreaming" of the handicapped into the public schools, and to employers.

Following are two illustrations of how information in this handbook could be used in providing services for the severely handicapped.

Placement programs may be developed by using the information in this handbook. Setting up such a program involves two steps. First, potential jobs and employers in a community must be located. The objective of this step is to assess the local employment situation so that the training process can be realistically directed toward employment opportunities. Information on the job areas represented in the community should be systematically collected and catalogued in a central file according to appropriate characteristics, for example, work area or field, type of industry, size of institution, name of contact, extent to which each requires skills that persons with various handicaps can acquire (Peterson & Jones, 1976). The central file should be crossreferenced to other forms and to clients, and should be updated as required--as businesses change, as employers experience success with handicapped persons, or as changes occur in the training and placement program. The second step is to review job opportunities with specific employers. Contacts should be made with employers identified in completing the first step. While individual contacts are desirable, and in some cases most effective, group contacts may cover more ground and in the long run be as effective. A group contact would include meetings with groups of employers or their representatives. Later, individual employers can be contacted for discussion of specific job prospects (Peterson & Jones, 1976).

The lists of jobs and potential jobs identified in this handbook will be useful in assessing the local employment situation. Employers can be sought out who employ people at these or similar jobs, and training programs can be developed around these jobs or job clusters. Additionally, the handbook can be used to provide evidence to a potential employer that handicapped persons have succeeded in jobs similar to those in their businesses. This kind of information should be important in convincing potential employers that they may confidently hire handicapped persons.

Job redesign for the handicapped (Peterson & Jones, 1976) is another area in which information from the handbook may be useful. The purpose of job redesign is to alter jobs so that they can be done by the handicapped. It is expected that this strategy would be used with employers who have indicated a willingness to hire handicapped individuals but who feel that they do not have suitable jobs available for them. The procedure outlined below is an example of how reorganization of an employer's present job categories would permit the placement of a handicapped person.

1. Survey of the Employer's Job Situation. By observation and discussion with the employer or his or her representatives, obtain information about job possibilities for the handicapped person who is under consideration. Job areas identified in this handbook are potentially fruitful leads. Many of them may be the same or parallel to those listed in the Worker Trait Group tables of this handbook and, therefore, may be obvious possibilities for employment. Other jobs may need to be analyzed in order to identify the job activity requirements found within them (Peterson & Jones, 1976).

2. Analyzing a Group of Jobs. Once the general job situation is known, study a few of the jobs more intensively. Solicit the employer's help in changing jobs that have a functional or physical relationship to each other and that present minimal problems in reorganizing the activities and requirements. The jobs should also be in high demand and offer frequent openings.

   Within the job group, identify the specific activity requirements, again by observation and discussion. For those that are inappropriate for a handicapped person, new requirements should be developed. List the activities found in the job group, indicating the percentage of time spent in each activity. Also provide estimates of the personal characteristics required by each revised job.

3. Redesigning the Job Requirements. Without changing the number of jobs, regroup the activities and requirements of the selected jobs and sort them into a series of new jobs in which activities and requirements are as much alike as possible. To illustrate, if the activities and requirements of five jobs are arranged in order of difficulty and five new jobs are designed on the basis of this listing, a mentally retarded person may be able to do the job whose activities are at the bottom of the list. If this is the case, the retarded person will be performing unskilled functions formerly done by a semiskilled worker. The employer benefits from this redesign of the job because the more skilled worker is freed from doing the unskilled or less skilled work. At the same time it opens a job for a handicapped worker who can perform the unskilled tasks in a perfectly acceptable manner (Peterson & Jones, 1976). The manner in which activities and requirements are redesigned will depend upon the handicap of the individual worker. If the worker is orthopedically handicapped, job activities will be ordered by the physical requirements of mobility or lifting. If the worker is emotionally handicapped, job redesign may proceed according to the level of personal interaction, the variety of tasks to be performed, or some other relevant criterion.

SOME CAUTIONS IN THE USE OF THIS HANDBOOK

It is important to note two cautions in using this handbook.

- Information contained here cannot substitute for a careful, individual assessment of the capabilities, needs, and wants of the individual. Generalizations about handicapping conditions are useful for conceptualizing and conveying information, but they must be used cautiously when dealing with individuals. In considering the handicapped person, the needs, capabilities, and traits of the individual are paramount, not the handicapping category or condition.

- This handbook is not intended to reflect actual training or job possibilities in business and industry in every geographical area. Obviously, the job market will vary from area to area. Indeed, one of the first steps in training and placing a handicapped person is to identify those jobs in the community for which he or she might be successfully trained.

job clusters

CLUSTERING SCHEME AND RATIONALE

Considerable attention was given to the selection of a suitable clustering scheme for this handbook. The vocational training field is replete with occupational clustering schemes, which generally include economic models, individual competencies models, and manpower training models.

Economic models cluster occupations around economic centers in our society. The scheme of 15 career clusters developed by the U.S. Office of Education is an example of an economic model. Its essential purpose is to predict groupings that are likely to occur in the future labor market in the United States. Clustering is based on similarity of broad economic activities in which enterprises are engaged, for example, Business and Office Occupations, Marketing and Distribution Occupations, and Communication and Media Occupations.

Individual competencies models focus primarily on clustering the competencies required of the individual, although consideration is also given to abilities, interests, and aptitudes. This clustering scheme is based on the assumption that a large number of jobs are open for which an individual can qualify, and the cluster forms the basis for individual guidance. Examples of individual competencies models are the Project TALENT clusters developed by Flanagan and associates (Flanagan et al., 1973), and the Dictionary of Occupational Titles (DOT), which is described below.

The manpower training models were developed primarily for technical training in industry. Clusters in this model are based on task and skill commonalities. All jobs requiring similar skills are grouped to form a cluster, and training programs are developed to emphasize skills common to many occupations. An illustration is the Maryland Cluster Design used in vocational training (Maley, 1975), which groups occupations into Construction Cluster Occupations, Metal Forming and Fabrication Occupations, and Electronic-Mechanical Installations and Repair Occupations.

THE CLUSTERING MODEL ADOPTED FOR THIS HANDBOOK

The RFP for this contract suggested that the 15 career clusters developed by the U.S. Office of Education be used in organizing potential employment areas for the severely handicapped. The rationale for this was to provide prospective contractors with the same frame of reference.

A primary concern expressed in the RFP was to determine what occupations within each cluster are suitable for severely handicapped persons. In developing the handbook, it became apparent that an individual competencies approach would be more fruitful than an economic model approach, simply because the handbook focuses on skills in which persons with a given handicap have proven trainable. Once jobs being held by handicapped persons were determined, the DOT, which clusters jobs according to the skills needed to perform them, was used to identify jobs requiring similar skills, thus allowing extrapolation of "new" jobs and job areas. The clustering scheme encompassed as wide a range of jobs as possible to avoid overlooking potential areas.

In this individual competencies approach, occupations were grouped according to the worker trait groups of the DOT. Occupations were clustered according to level of sophistication required by jobs in dealing with data, people, and things.

The DOT provides 114 worker trait groups, organized within 22 broad areas of work:

Art
Business Relations
Clerical Work
Counseling, Guidance, and Social Work
Crafts
Education and Training
Elemental Work
Engineering
Entertainment
Farming, Fishing, and Forestry
Investigating, Inspecting, and Testing
Law and Law Enforcement
Machine Work
Managerial and Supervisory Work
Mathematics and Science
Medicine and Health
Merchandising
Music
Personal Service
Photography and Communications
Transportation
Writing

Several worker trait groups are within each of these broad categories. For example, the area of Clerical Work contains, among others, these worker trait groups:

1. Secretarial and Related Work

2. Classifying, Filing, and Related Work

3. Typing and Related Work

4. Switchboard Service

For a further explanation of the DOT worker trait group clustering scheme, see the Appendix.

barriers to training and employment

A CONCEPTUAL FRAMEWORK

What is a handicap? From an employer's viewpoint, a handicap is a deficit in the resources, relative to the demands of a job, that a person brings to that job (Baroff, 1973). For example, a person who cannot see well is handicapped in a job that requires good vision; if a job requires mobility, an immobile person is handicapped; or, if a job requires carefully reasoned decisions, a person unable to think things through is handicapped.

From an individual's viewpoint, a handicap is a condition that interferes with obtaining a desirable job. The condition may make it difficult to train for a job that the person could perform successfully if he or she were trained, for example, a blind person who wishes to learn auto mechanics. Similarly, a handicapping condition may make it difficult to secure a job that the person could successfully perform, for example, a paraplegic who has difficulty getting to and from work. Finally, such a condition may directly affect the person's ability to perform on the job, for example, a deaf or speech-impaired person who wishes to teach.

Thus, in considering handicaps in relation to work, one must go beyond the handicapping condition(s) and ask about the practical importance of the particular condition relative to job training, job placement, and job success. One useful approach, and the one adopted here, is to consider handicaps as conditions that cause the person to confront barriers to achievement in excess of those confronted by the nonhandicapped, and to identify strategies for overcoming these barriers so that successful training and placement can be achieved.

THERE ARE MANY TYPES OF BARRIERS

Barriers may exist within a person (internal) or an environment (external). Most situations involve a combination of barriers, but for the present purposes, discussing them separately will be useful. To illustrate, some internal barriers are the inability to see, to hear, to communicate, to think; other internal barriers include a lack of physical coordination, lack of motivation, inability to attend to one's surroundings, or a lack of perseverance at tasks. External barriers, on the other hand, related to the physical environment and to the behavior and attitudes of others in that environment toward the severely handicapped. Examples of external barriers are a lack of transportation and unreachable or unusable public facilities such as telephones, drinking fountains, counters, and sidewalks. Some other external barriers are bias, prejudice, indifference, and lack of social acceptance, parental support, or understanding by others.

In regard to jobs, a handicapping condition may be a barrier to at least three facets of the job. First, the condition may be a barrier to actual task performance, as in the case of the deaf-mute who wishes to teach. The second facet is job selection; a handicapping condition may be a barrier to training or placement, although the condition may have nothing to do with the ability to perform. The blind auto mechanic illustrates such difficulties, as do the problems often faced by epileptics who find the doors closed to many jobs even through their seizures are controlled. The third facet is job retention, and a handicapping condition may be a barrier to this goal. A handicapped person with an extreme cosmetic condition, for example, may alienate fellow workers and, regardless of his or her ability to do the work, may lose the job.

BARRIERS VARY IN IMPORTANCE

In a sense, of course, all people are handicapped in that everyone has at least some resource deficits relative to the demands of certain jobs. For example, it is difficult for a short person to be a professional basketball player or for an exceptionally tall person to fit into the cockpit of a fighter plane; not everyone has the finger dexterity to be a professional pianist, and many persons cannot think with the logic and precision necessary to be a computer programmer. Thus, one must consider the importance of a handicapping condition in terms of the extent to which the individual's condition makes it difficult to train for, be placed in, or to succeed at a desirable job. All the severely handicapping conditions of concern in this handbook lead to many major barriers for those who have such conditions.

Another point to clarify is that handicapping conditions are not all equally relevant to task performance, job selection, or job retention. Strategies for training and job placement should be chosen for the handicapped person based on the relevance of the handicapping condition. For example, placing a handicapped person in a job in which the handicapping condition is irrelevant to the job should not be difficult if the person possesses the nonhandicapped-related resources. On the other hand, if the handicapping condition is relevant, it may be an impediment rather than an insurmountable barrier. Barriers do not represent all-or-nothing conditions. Visual deficits, for example, are not insurmountable; jobs in which sight is important may be modified so that tasks requiring sight are minimized. The mentally retarded overcome many barriers and perform tasks of surprising complexity given effective training techniques and time (Gold, 1972, 1973, 1974; Gold & Barclay, 1973).

DESCRIPTION OF BARRIER TABLES

The tables that follow identify types of barriers that handicapped workers face in their attempts to gain relevant vocational training and job placement. Attitudes, skills, communication, and environment are the major barrier groups. Within each of these major barrier groups, functional barriers are listed and some strategies for overcoming them are provided. Examples of how these strategies may be applied are also given.

barrier tables

Barrier 1.0 Attitudes

Handicapped persons, or those with whom they deal, frequently hold unrealistic attitudes regarding the individual worth, potential, or competence of handicapped persons. For the handicapped themselves, this may give rise to inappropriate feelings of unworthiness, helplessness, or inferiority. Examples of attitudes manifested by the nonhandicapped are failure to appreciate the contributions that handicapped workers can make, discomfort when associating with obviously handicapped people, and fear of increased insurance rates or of a detrimental effect on the company image.

Attitudes may be regarded as underlying learned predispositions that exert a consistent influence on an individual's evaluative responses. In trying to produce changes in the self-concepts of handicapped persons, getting them to say they think more highly of themselves is not sufficient; rather, the goal is to have the handicapped behave in a variety of changed ways--toward themselves, toward other handicapped people, and toward the nonhandicapped. Psychologists generally divide attitudes into three components: affective, cognitive, and behavioral. Techniques designed to change only a person's emotional reactions toward another person attack only one component of the attitude in question. This point partially explains why attitude modification is a difficult and sometimes unsuccessful process. Simply giving people information is not enough. Research has indicated that active participation, as in roleplaying, is more effective in changing attitudes than is passive exposure to persuasive communications (Zimbardo & Ebbesen, 1969).

Functional Barrier 1.1 LACK OF KNOWLEDGE REGARDING CONSEQUENCES OF HIRING THE DISABLED

Employers mistakenly believe that if they hire the severely disabled their insurance rates will increase, they will have increased costs for training and adapting their working environment, and customers and other employees will react adversely to associating with obviously handicapped people.

STRATEGIES FOR OVERCOMING THIS BARRIER

EDUCATION Employers should be educated so that they know that workmen's compensation insurance rates do not increase when the handicapped are employed. Insurance rates are determined by the type of work conducted, not by the characteristics of the employees. Insurance companies should continue to inform policy holders that hiring the severely disabled is encouraged and will not adversely affect a company's insurance rates (American Mutual Insurance Alliance).

Another component of employer education should focus on the potential positive aspect of having handicapped persons function successfully with nonhandicapped workers. In some cases morale of nonhandicapped employees has improved, as exemplified by fewer employee complaints and reduced criticism about their jobs.

In order to make employers and co-workers comfortable in the process of interviewing and working with the severely disabled, seminars, filmstrips, and printed matter that explain how to react to the severely disabled should be provided. Such training aids could be provided by nonprofit organizations, federal and state agencies, and professional business associations and should include practical, everyday advice such as the following, suggested by the President's Committee on Employment of the Handicapped:

1. Stop thinking of impaired people as "disabled." This description was adopted to soften the word "crippled," but the connotations of "disabled" are even more painful. The word implies across-the-board inability to perform, and this is not true.
2. Don't dismiss the idea of employing impaired workers without finding out what they can do on a fair and equitable basis.
3. Let these workers compete. Many people, in a sincere effort to help, actually make things more difficult for the handicapped. The human and economic needs of the handicapped are best served when they are allowed to become self-supporting and, thereby, to make their contributions as self-reliant members of society.
4. Recognize the handicapped as individuals and deal with them accordingly. Sometimes their physical problems limit the scope of their activities, but they should be considered and recognized for their individual skills.
5. Don't patronize people with physical disabilities. The handicapped don't want to be coddled or fussed over.

LEGISLATIVE ACTION Legislative action regarding the employment of the handicapped is one method of overcoming attitude barriers. For example, Section 503 of the Rehabilitation Act of 1973 contains a strong affirmative action clause for organizations utilizing federal monies after January 1976. Every federal agency contract of more than $2,500 requires that qualified handicapped applicants be actively recruited, considered, and employed, and that all qualified handicapped employees be afforded nondiscriminatory consideration for promotion and job advancement. No handicapped individual may be discriminated against on the basis of a handicap. Additional legislation will be required to define discrimination and to determine when an abuse occurs. And since business/industry is often hesitant to hire the handicapped, the handicapped need to acquire a social militance to pressure employers to consider them for employment (U.S. Department of Labor, Manpower Administration).

RESPONSIBILITIES OF EMPLOYERS

Employers should be encouraged to seek the cooperation of management, employees, and union personnel in a campaign to develop affirmative action plans and to hire qualified handicapped employees. As part of this effort, employers should:

1. Actively recruit persons with disabilities.
2. Analyze their hiring processes by reevaluating the emphasis given to medical histories in the screening process. Physical examinations should be used for selective placement and not for selective elimination. Employers might consider giving examinations in nontraditional ways.
3. Restructure or modify jobs to reduce the effect of a disability on a worker's performance. This may require making hours more flexible; splitting one job between a handicapped person and another part-time employee; and designing a "sheltered enclave" for handicapped workers.
4. Change equipment or add adaptive devices to make the job situation more amenable to the needs of handicapped persons. In some circumstances, the employer's State Department of Rehabilitation may provide handicapped persons with specialized equipment that will help them do their jobs.
5. Adopt the 700-hour temporary trial appointment system, used by the Civil Service Commission, for severely handicapped persons.
6. Offer consultation services to rehabilitation workshops and to local school districts and volunteer to serve on local vocational education advisory committees.

Functional Barrier I.2 LOW EXPECTANCY ON THE PART OF SOCIETY

People working with the handicapped decide, on the basis of their own experiences, the performance capabilities of the handicapped. They then, as a self-fulfilling prophecy, seek to prove themselves to be right. As a result, the handicapped people they work with do only what is expected of them. Severely handicapped workers are conceived of as permanent members of a surplus labor force; hence, no really rewarding job situations are developed for them.

STRATEGIES FOR OVERCOMING THIS BARRIER

DEVELOPMENT OF GENUINE COMPETENCIES	Emerging technologies designed to help individuals who find learning difficult may be utilized. Examples of these technologies include discrimination learning, attention-retention theory, behavior modification, and such specific techniques as matching-to-sample, oddity, clustering, fading, and shaping (Gold, 1975). The goal is to produce skill on the job when removal from the job would require training another worker. To illustrate, a 21-year-old severely retarded male was taught to complete the assembly of 52-piece cam switch actuator. Training was accomplished by dividing the task into 52 steps, each of which involved both manipulation and discrimination components. The use of bins, a metal stabilizing post, two types of retaining ring tools, and tweezers was required. In a six-month period the handicapped worker's production rate ranged from 74% to 133% of normal; his monthly earnings (piece rate) ranged from $76.86 to $131.46, with a monthly average of $99.69 and an hourly average of $1.00 (Bellamy, Peterson, & Close, 1975).
PUBLIC AWARENESS	Obtain media coverage to make the public aware of the successes of handicapped workers in a variety of jobs.

Functional Barrier 1.3 LOW SELF-ESTEEM

This barrier involves a set of personal attitudes that behaviorally manifests itself in a lack of interest in job training or possibilities, withdrawal from learning and working situations, a lack of persistence in difficult tasks, ready discouragement, lack of personal planning, etc.

STRATEGIES FOR OVERCOMING THIS BARRIER

SUPPORTIVE COUNSELING	Counseling may be accomplished either individually or in groups, while in training or after a person has been placed on the job. It may be done by a single counselor or by a team. The intent is to foster self-reliance and to encourage clients to undertake appropriate work tasks. For example, the Sacramento Society for the Blind established an intensive five-week vocational course for young adults 15 to 20 years old. The Self-Reliance Institute operated on three basic assumptions: first, that blind adolescents behave according to the expectations of those around them; second, that they are essentially underachievers with poor self-images; and third, that they have a latent capacity to become productive workers. The individualized approach often used with the handicapped was abandoned in favor of a "bootcamp" attitude which pushed the group to achieve. The five-week course included part-time work experience, daily living instruction, and job placement (Laurence, 1973).
WORK EXPERIENCE	Realistic work-setting experience may be provided to the client either in a workshop setting or in a work station in industry. Supervision may be provided either by rehabilitation personnel or by the employing business or industry. Guided success in an actual work experience appears to be highly motivating. For example, the Occupational Training Center (OTC) in St. Paul, Minnesota, trained handicapped and multiply handicapped youths and adults for useful employment. New clients were evaluated by counselors and instructors on the basis of their performance during a three-week "testing-by-doing" period. If OTC could help a client, she/he was accepted and an occupational development plan was designed for her/him. OTC used task analysis and job reengineering to facilitate training and placement of the handicapped. OTC entered into agreements with several private industries in order to place their clients in actual job situations for further training. In order to prepare employees more fully for outside employment, OTC offered individual instruction units on grooming, community relations, employer expectations, and personal and social attitudes (Durand, Nelson, & O'Brien, 1973).
BEHAVIOR MODIFICATION	Behavior modification techniques may be used to reward appropriate assertive behavior (leading to a change in attitudes) either in training or in the work situation. The technique includes identifying appropriate target behaviors (either to be increased or to be decreased), obtaining baseline data, and systematically altering stimulus conditions and/or reinforcement contingencies while recording changes in target behavior. Behavioral modification techniques were used in a study of the effects of using money, social praise, and production charts as reinforcers to increase production in a collating task. Eighteen 12- to 20-year-old retarded and severely emotionally disturbed students in a public school were the subjects of the study. Differential increases in productivity were achieved. The study found that performance generally improves when reinforcers are provided; that prevocational programs in public schools are capable of providing other agencies with valuable vocational skills information for their clients; and that many severely handicapped persons either do not know how to use money or are not allowed extensive use of it even though it is the primary reinforcer in our society (Brown, VanDeventer, Perlmutter, Jones, & Sontag, 1972).

Barrier 2.0 Communication

Barriers addressed in this section arise from difficulties in receiving, apprehending, or relating information. Such difficulties may result from sensory or motor disabilities or from processing dysfunctions other than those caused by mental retardation. The skills needed to establish interpersonal relationships in which persons become more sensitive to, and effective in meeting, each other's social and psychological needs are not covered in this section; such skills are dealt with in the section on Attitudes.

Functional Barrier 2.1 IMPAIRED ABILITY TO SPEAK OR HEAR

Many jobs presuppose that workers will be able to talk to one another or to customers and clients. Those who cannot speak, who have speech that is especially difficult to understand, or who have hearing impairments may need special aids or training if they are to perform such jobs satisfactorily.

STRATEGIES FOR OVERCOMING THIS BARRIER*

DEVICES THAT USE VISUAL DISPLAYS IN LIEU OF SPEECH

Lapboards (or matrix communicators) containing words, letters, or other symbols at which the user may point, have long been used by those whose disabilities exclude writing as well as speaking (Cohen, 1976). Typically, boards require relatively dexterous use of the hands or a headstick, and communication using them is usually slow.

Speed and ease of communication using lapboards can be significantly enhanced by devices that make fewer physical demands on the user. Joysticks or pressure-sensitive pads that can move a light beneath the translucent face of a lapboard is an example. This system has the added advantage of allowing the lapboard to be placed somewhere other than on the lap of the user. Thus, the board might be placed where it could be viewed conveniently by all parties to the communication. Strip printers can be incorporated into matrix communicators, allowing the handicapped worker to spell out an entire message that can then be read by a nonhandicapped colleague who can attend to other duties while the message is being spelled out (Tufts-New England Medical Center). Similarly, in job situations where relatively few commands or replies must be given frequently, strip printers that produce an entire message in response to a single movement of a joystick (TRACE Center) or that flash a light adjacent to a sentence or phrase show promise (Veterans Administration). Such devices all suffer either from being slow and tedious to use or from being relatively inflexible in the variety of messages that can be transmitted; they are most useful on jobs where frequent, rapid, or intricate communications are not required.

SPEECH AUGMENTATION OR GENERATION DEVICES

The electronic larynx amplifies softly-spoken speech, rendering a normal-sounding voice. It has been used successfully by post-laryngectomy patients and others with similar functional difficulties in speaking loudly enough to be heard. This device allows its user to operate normally in almost any situation where speech is needed.

For those who cannot speak at all or who cannot speak intelligibly, an adaptation of a calculator that voices answers to the blind shows promise. This device has a 64-work spoken vocabulary, and words can be chosen to meet the needs of the client. Wisely chosen, 64 words can express a large proportion of the commands or requests needed in many job situations.

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*Many strategies for overcoming communications barriers involve electromechanical aids of one sort or another. Some specific devices are, therefore, discussed by way of illustration in this section. It should be understood that these discussions do not constitute a complete listing of available devices, nor do they constitute guarantees as to the suitability and availability of particular devices.

BASIC COMMUNICATION SKILLS FOR CO-WORKERS

Most co-workers will have had little experience with people who have serious trouble hearing. They will not know what to do to make communication easier. Simple tips to facilitate lipreading (NTID) can be taught quickly, as can a few basic signs. Co-workers can readily be taught to speak slowly and clearly, to face the deaf person directly, and to avoid pacing, standing in shadows, or standing before a bright background when speaking to the deaf; they can be encouraged to expand their signing and finger-spelling skills.

SPEECH THERAPY FOR CLIENTS

There are many techniques of speech and language therapy that can help people with hard-to-understand speech speak more clearly. To be most effective, a counselor or speech therapist may wish to assist during the transfer of skills from the training environment to the work place (Bentzen, 1973). As part of the transfer, the counselor may wish to help other employees learn to understand the client's speech; the ability of others to understand the client may improve more rapidly if the therapist serves as a "translator" or provides other help. Such assistance may smooth the way for persons with any of the large number of handicapping conditions that can make speech difficult to understand.

Functional Barrier 2.2 IMPAIRED ABILITY TO READ OR TO REVIEW ONE'S OWN WRITTEN WORK

Many jobs require a person to read or to prepare documents, memoranda, diagrams, and similar materials. Inability to do so is a serious problem for many multiply handicapped people, primarily those with visual impairments. Physical diabilities that cause difficulties in using typewriters are discussed under Functional Barrier 2.3.

STRATEGIES FOR OVERCOMING THIS BARRIER

"CONVERSION" OF PRINT TO SOUND OR TOUCH

The OPTACON (Optical to Tactile Converter) consists of a small camera and an electronics section. When the user moves the camera across a line of type, the electronics section converts the light pattern into a tactile pattern that can be felt through an opening in the electronics section (Telesensory Systems).

The Steretoner (Mauch Laboratories) is physically and conceptually similar to the OPTACON, but differs in that it converts the printed stimulus into a tone pattern. Such devices may be especially useful in technical fields where typeface variation is minimal (e.g., computer printouts) or where technical symbols and schematic drawings must be read (e.g., engineering and architecture). In the latter case, the elimination of the need for the production of raised-line drawings or laborious verbal descriptions by associates would be particularly advantageous.

A problem with these devices is that their normal use requires good fine motor coordination to "track" the camera across lines of type. For persons with relatively minor motor difficulties, a guide such as that developed for training beginning OPTACON users will probably solve the problem. This guide consists of two bars crossed at 90°. The camera is attached to one bar that is pushed from left to right to move from letter to letter, thus preventing the user from straying from line to line. This bar is attached to a gasket that rides on the second bar. Pushing or pulling on this gasket allows the user to move from line to line.

For those with more serious motor handicaps (e.g., many paraplegics and those with severe cerebral palsy), more sophisticated attachments may be needed. A joystick drive for the guide described above is a technically feasible solution.

SIMULTANEOUS PRODUCTION OF BRAILLE AND INKPRINT

"Braille verifiers" produce braille copies of documents with the production of a typed copy. Such devices are useful for blind typists who can use the tape to proof their work. Braille verifiers can also be used to produce braille copies of memos and other in-house documents to which both blind and sighted workers should have access. Some braille printers can be used with computer terminals, and some computer systems can print in braille as well as ink, using standard printout formats (Triformation Systems; Protestant Guild for the Blind).

Functional Barrier 2.3 DIFFICULTY IN USING STANDARD COMMUNICATIONS EQUIPMENT

Many disabilities make it difficult for people to use standard communications devices such as telephones and typewriters. These devices, widely exploited to provide job opportunities for the homebound when used in traditional ways, are opening many new possibilities to the homebound and non-homebound alike as components in computer systems. Thus, equipment adaptations will open a larger number of rewarding jobs to capable, physically handicapped persons.

STRATEGIES FOR OVERCOMING THIS BARRIER

TYPEWRITER MODIFICATIONS

Mouthsticks, headwands, mechanical page turners, special braces, and similar appliances have long been used as aids in typing and other clerical tasks. Most of these aids are also suitable when using computer keyboards. In a demonstration study conducted by IBM and the Woodrow Wilson Rehabilitation Center (Knorr & Hammond, 1975), only relatively minor equipment modifications were required to facilitate programmer training for severely physically disabled people. Modifications included a wire frame to hold paper upright when it emerged from the carriage, enlarged copies of portions of the programming manual posted on walls for quick reference, and an electrically activated platen reverse. For those unable to operate equipment modified in these ways, other adaptations are possible; for example, a one-finger input system for programming has been developed (President's Committee on Employment of the Handicapped, 1975), as has a device that allows single-switch operation of certain electric typewriters (Library of Congress; Bush Electric Company). For those with poorly coordinated movements, special keyboards are available that make relatively modest demands in this area (Library of Congress, 1972). Such keyboards can be positioned to allow operation by hand, arm, foot, or head.

Operation of typewriters presents few problems for the blind or visually impaired, but proofreading or editing can be difficult. Braille verifiers, discussed under Functional Barrier 2.2, are valuable aids for the blind. For the visually impaired, closed circuit television attachments can be used to present enlarged images when standard magnifiers are not adequate.

SPECIAL NEEDS TELEPHONE EQUIPMENT

Commercial telephone systems offer a wide range of off-the-shelf equipment for the deaf, the hard of hearing, the blind, those with speech impairments, and the physically handicapped (Smith, 1975). In addition, custom equipment can be developed for those whose needs are not met by what is presently available. Presently available equipment includes headset amplifiers; bone conduction receivers; extra loud or restricted frequency bells for the hard of hearing; a "code-com" attachment that converts sound into light flashes and vibrations, allowing coded signals to be transmitted; devices for the deaf that blink or cause lights to blink; and special dialers and headsets that place minimal physical demands on amputees or those with restricted use of their arms and hands.

More sophisticated telecommunications systems are available that allow telephone-mediated teletype communication. Such systems allow the deaf person to receive messages over the telephone at a rate as fast as the person sending the message can type. The obvious drawback is that both sender and receiver must possess considerable equipment; the countervailing advantage is the messages are preserved on paper. Another convenient system for telephone communication with the deaf is the Manual Communication Module (MCM), a light, battery-powered portable. The console has a receptacle that is compatible with all U.S. handsets, a 32-character readout for receiving incoming messages, and a keyboard for typing the message to be transmitted.

Barrier 3.0 Environment

Many work places and pieces of equipment make demands that are basically extraneous to the tasks being performed. Such demands, whether they arise from warning lights that the blind cannot see or high shelves that those in wheelchairs cannot reach, constitute serious barriers that have little or nothing to do with job competence; yet they hinder the handicapped worker as he or she seeks to accomplish the job. Strategies discussed in this section can be used to overcome barriers that arise because of the structure of the physical environment.

Functional Barrier 3.1 INABILITY TO USE ORDINARY MEANS OF TRANSPORTATION

Few issues are as important to disabled people as accessible transportation services. Transportation can make the difference between meaningful work and mere subsistence, between sharing the community of one's friends or being isolated. The availability of accessible transportation directly affects one's quality of life.

STRATEGIES FOR OVERCOMING THIS BARRIER

EDUCATION Architects, designers, contractors, and developers should be taught about the mobility needs of the handicapped so that they can begin designing and building barrier-free environments. In order to satisfy even the minimum requirements, the following elements of barrier-free design should be incorporated into all building designs as well as local, state, and federal building codes (The Rehabilitation Institute of Chicago):

1. At least one primary entrance is wheelchair accessible.
2. There are elevators between all floors.
3. All essential areas not served by elevators are accessible by an appropriately constructed ramp.
4. Places of public assembly have clear viewing spaces where persons may remain in their wheelchairs.

DESIGN Public transportation should be designed so that vehicles are accessible to the handicapped; or specially designed buses could be provided on a case-by-case basis. As a guide to the design of public buses for the handicapped, the Regional Transportation District in Denver, Colorado contracted for buses to be built with the following characteristics:

1. wheelchair lifts
2. wheelchair tiedowns
3. extendable steps
4. bench seating
5. flip armrests
6. specially coated, non-slip handrails and stanchions
7. accessible signal tap switches
8. audible tones for doors
9. additional lighting in stepwell and door areas
10. internal public address systems

The Regional Transportation District also identified those characteristics of bus transportation which have a minimal effect on manual operation but which have a high potential benefit for a large percentage of transit riders. The following characteristics were identified:

1. Extendable steps: Extendable steps provide a low step for increased accessibilty and safety.
2. Additional grabrails and stanchions: These provide easier entrance to and exit from the buses as well as increased safety and stability inside the bus.
3. Side destination signing: A much requested feature which aids the visually impaired

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Functional Barrier 3.2 INABILITY TO FUNCTION IN A BUSINESS SETTING BECAUSE OF ARCHITECTURAL BARRIERS

A number of severely handicapped persons find that moving about, including the management of transportation vehicles, is a barrier to vocational success. There are a number of carriers, including public and private transportation, escalators, and elevators, that are difficult or impossible to use. Many of the physically disabled are unable to work and move about in the average business/industrial setting because of the placement of light switches, elevator buttons, and drinking fountains. The handicapped are also inhibited by bathroom layouts, table and desk layouts, and stairs.

STRATEGIES FOR OVERCOMING THIS BARRIER

EDUCATION Designers, architects, builders, and community planners should be taught the design elements that are needed to make buildings and facilities accessible to the handicapped. In order to satisfy the minimum requirements, the following features that eliminate barriers to the handicapped should be included (the President's Committee on Employment of the Handicapped):

1. At least one building entrance at ground level
2. 32" wide doors that open easily
3. Level thresholds to buildings and rooms
4. Sloping ramps instead of stairs (ratio--1 to 12)
5. Convenient parking, accessible to buildings
6. Access by handicapped to elevators
7. Restrooms with wide stalls and grabbars for wheelchair users
8. Handrails on all stairways where steps cannot be eliminated
9. Non-slip floors
10. Lower fountains and public telephones for wheelchair users
11. Level walks with no curbs at crossways

DESIGN Buildings and facilities should be designed so that they eliminate barriers to the handicapped. Several organizations and publications can provide specific references regarding the redesign of drinking facilities, bathrooms, halls, light fixtures, desks, phones, ramps, etc. Of particular interest are "custom design" companies such as Independence Engineering, Inc., and publications such as Guidelines for State and Local Vocational Rehabilitation and Employment Committees (National Association for Retarded Citizens) and the Directory of Vehicles and Related Systems Components for the Elderly and Handicapped (U.S. Department of Transportation, Urban Mass Transportation Administration).

PLANNING Employers should establish planning committees to study barriers and their elimination so that the facilities can be improved. The committees should write letters to handicapped persons inviting them to accept membership on the planning committees.

COMMUNICATION Buildings should be clearly marked with the international symbol of access to identify accessible entrances, restrooms, and directional routes (U.S. Department of Health, Education, and Welfare).

and handicapped in bus identification.

4. Additional lighting in stepwell and door areas: A significant safety feature which aids the visually impaired during nighttime operations.
5. Spot or floodlights for outside door areas: A safety feature which aids the general public as well as the elderly and handicapped during nighttime operations.
6. Internal public address system: This is used for destination announcements, especially for the visually impaired.
7. Audio warning signal operating with door: A safety and convenience item for the audio/visually impaired.

DISSEMINATION The specific guidelines for the design of transit buses, school buses, and other vehicles developed by the Franklin Institute Research Labs (FIRL) and published by the U.S. Department of Transportation, Urban Mass Transportation Administration, should be distributed. Distribution of the guidelines will ensure that those who design, build, or purchase such transportation equipment are aware of the requirements of the disabled. This very specific information serves as a resource of design requirements for barrier-free transportation vehicles, as well as a directory of companies and suppliers who handle special equipment and services.

COMMUNITY PARTICIPATION Communities should consider providing vans, buses, or other vehicles designed especially for the disabled as part of ongoing rehabilitation, social, and employment services. Transportation for disabled individuals could be provided as needed or on a scheduled basis (Regional Transportation District, Denver, Colorado).

LEGISLATION Laws regarding the removal of barriers and the provision of special accesses should be enforced. Organizations should be encouraged to conduct activities in settings that are free of architectural barriers.

Functional Barrier 3.3 DIFFICULTY IN PERCEIVING AND RESPONDING TO ENVIRONMENTAL SIGNALS

Nearly every work environment requires the worker to perceive signals, to apprehend their significance, and to behave appropriately on the basis of these signals. Signals include the obvious gauges, meters, rulers, warning lights, buzzers, and other such items. Signals, as used here, also includes environmental information that the nonhandicapped use to guide their behavior but which is inaccessible to those with certain handicaps. Visual signals arising in the natural course of work provide a ready class of examples--the proper positioning of a tool or the guiding of a board through a saw are usually done using visual information picked up from the work environment; frequently, alternate signaling systems can be found.

STRATEGIES FOR OVERCOMING THIS BARRIER

AUGMENTATION OF SYMBOLS

There are two points at which a signal may be augmented: (1) at the source of the signal by making it brighter, louder, larger, or effecting similar alteration; and (2) near the point of reception by providing the worker with an implement that will alter the signal to make it perceptible. Wherever the alteration is effected, consideration must be given to the specific needs of each individual, and to constraints that exist in the environment in which the augmentation is to take place. (For example, it would not be difficult to substitute an 8-inch gong for the usual bell on an electric typewriter to signal when the right margin is being approached; such a modification would obviously be unsatisfactory in an environment in which a hard-of-hearing typist has co-workers with normal hearing.)

In many cases, auditory or visual deficits are more severe in some frequencies or wavelengths than in others; a tone or light that capitalizes on the worker's best frequency or wavelength can be substituted for standard bells, buzzers, or lamps. If such modifications are unsatisfactory, workers can be supplied with hearing aids; magnifiers (hand held or mounted in stands or on eyeglasses); high intensity, low glare lamps; closed circuit television systems; and the like. Enlarged print can be used in manuals and diagrams for the partially sighted; enlarging lenses can be fitted to gauges and meters; or faces on gauges and meters can be enlarged or printed in colors selected to enhance readability. (For excellent discussions of aids for the visually impaired see Sloan, 1971; American Foundation for the Blind, 1976; and Sensory Aids Foundation, forthcoming.)

PRESENTATION OF SIGNALS IN A DIFFERENT MODALITY

Augmentation is not always sufficient. In such cases, a modality shift may be satisfactory. Warning lights can be replaced by bells or buzzers for those with visual handicaps, while bells and buzzers can be replaced by lights for the deaf or hard of hearing. Such systems can be made to start fans or vibrating motors if a deaf-blind person must be signaled. Such modifications are ideal warning signals for fire, equipment malfunctions, or other emergencies.

The Wrist-Com (Kruger, 1976) is particularly versatile. Attached to the wrist of the wearer, this device vibrates in response to signals transmitted to it and can be used to indicate a variety of environmental events through coded signals.

Many tools and measuring devices that have raised letters or braille letters and numerals are available for the blind (Clark, 1973). Similarly, special guides and jigs can be built to help a deaf-blind individual position tools or parts or guide materials through power equipment. Controls and other manipulative devices that are traditionally distinguished by sight can be altered to be distinguishable by touch; often this is as simple as roughing up one or two smooth knobs with a file. In other cases, more sophisticated solutions may be required, and many of these are available or are under development (Sensory Aids Foundation, forthcoming). While it is beyond the scope of this handbook to discuss all of these devices, a few will be noted: a pressure gauge for discovering leaks in refrigeration systems that buzzes when the pressure is incorrect; an audio indicator accurate to 1/1000 of an inch that allows machinists to make angular and linear measurements; and light probes that allow detection of differences in light intensity, useful in gauges and in a host of other applications (OPTACON Fund Quarterly Reports).

For performing mathematical computations, "talking" calculators that report the results of computations audibly are available for the blind, as are others that supply results in braille. The latter will be a particular boon to the deaf-blind and to those blind persons who work in noisy environments or in close proximity to others who might be distracted by frequent "spoken" answers.

Functional Barrier 3.4 DIFFICULTY IN USING OBJECTS IN THE WORK ENVIRONMENT

Any number of objects (and pieces of equipment) can interfere with job performance; many items may prove difficult to reach, difficult to manipulate, difficult to operate, or easy to damage. All workers face these problems at one time or another, and a branch of engineering--human factors engineering (Chapanis, 1968)--attempts to solve these and related problems. Handicapped workers often face problems greater than those faced by their nonhandicapped co-workers; frequently, they face major barriers in using objects in the work environment, while the nonhandicapped face none at all.

USING THESE STRATEGIES

The strategies discussed below can be used in many situations beyond those used to illustrate them. In applying these strategies, one should begin with a simple analysis, asking first what duties the worker must perform and what activities must be carried out to fulfill these duties. Next, those activities that prove particularly difficult should be identified. Some activities are crucial in executing job duties, while others are not. The former include activities that are inherent in the nature of the job--accountants must do arithmetic, mechanics must clean and gap spark plugs, and so on. The latter include activities that, while not inherent in the task, may be required in a particular job setting; for example, lifting heavy manuals is not the essence of computer programming, but it is often required. The first two strategies discussed below are appropriate to the latter class of activities, while the third and fourth strategies apply to the former class.

STRATEGIES FOR OVERCOMING THIS BARRIER

ALTERATIONS IN THE WORK STATION

The setting in which a handicapped worker must perform is sometimes not conducive to accomplishing the job, even though the worker is capable of accomplishing it. Items may be placed out of reach or may be difficult to handle or manipulate. In the former case, an evaluation of the person's reach will enable objects to be placed where they are easily accessible. This is not simply a matter of adjusting the height of desks, benches, and shelves; the depth of shelves and benches, the distance from the edge of a bench to tool-racks, and the provision of adequate knee room for a person in a wheelchair to pull up fully to the bench or table are among other factors that must be considered.

Humanscale 1/2/3 (Diffrient, Tilley, & Bardagjy, 1974) provides detailed measurements showing the range of reach for persons in wheelchairs. Measurements are shown for persons of different heights relative to shelves and work surfaces; knee and foot clearances are also taken into consideration, as are passage widths, space needed in which to turn, toilet facilities, ramp design, floor coverings, and positioning of common items such as telephones. Similar data are provided for those who use canes or crutches, and environmental design tips are included for environments to be used by the blind or the deaf.

A related approach is to eliminate the need to reach an object in the usual way. Knorr and Hammond (1975), in their discussion of computer programmer training, describe how portions of manuals were photoenlarged and posted on classroom walls. Other reference works were propped up on lazy Susans so that pages could be turned with a mouthstick. Lazy Susans can be designed either for manual operation or for rotating in response to a switch.

Even if objects can be reached, they may prove too bulky or cumbersome to manipulate, or they may put excessive demands on fine-motor coordination. Such problems may be manifest in many ways, and solutions must be developed as each problem arises. Many solutions are little more than common sense:

1. Bulky, loose-leaf programming manuals, auto parts books, repair manuals, and the like can be broken up into several lighter volumes.
2. Rubber tubing, styrofoam, or rubber bands can be put around pencils, pens, screwdrivers, and the like to "enlarge" them. For those for whom these solutions are inadequate, holders are available to aid in gaining a firm grip; some attach directly to the hand if a satisfactory grip cannot otherwise be achieved.
3. Items such as staplers and writing paper that tend to "run away" when bumped by the uncoordinated can be fastened down using clamps, clipboards, etc. A ridge can be constructed around the edge of a workbench, table, or desk to restrain objects that cannot be fastened down either because it is physically difficult to do so, or because they must be picked up and used. Such a ridge would also be useful to any worker who has physical disabilities that make it difficult to retrieve items that have fallen from his or her desk or workbench.

EQUIPMENT MODIFICATIONS

Equipment may make demands on the worker that he/she cannot meet, but that are not inherently crucial to satisfactory performance. For example, many sewing machines are operated by treadles, but the critical factors in successful sewing should be positioning the cloth and moving it through the machine, not movement of the foot; treadles are used to control the needle speed only because they are convenient for most people. Motor speed can be controlled by switches operated by the knee, head, or mouth, and most equipment can be modified to permit this. (Of course, the reverse strategy will be needed for operation of machines with manual control by those persons with better foot than hand coordination.) Similarly, levers, handles, knobs, and buttons can be altered or repositioned to allow operation by those who could not formerly use them. Common alterations that may be needed include the following:

1. enlarged handles that can be more easily grasped;
2. protruding buttons to replace recessed ones for those persons with poor fine-motor coordination;
3. levers to replace knobs, thereby providing a better purchase for the weak;
4. push-pull or joystick controls to replace those that must be rotated, thus placing fewer demands on fine-motor coordination;
5. controls that are repositioned to place them within reach of an unparalyzed extremity; and
6. rings or extensions that are added to wheels or levers so that they can be moved more readily by an amputee with a hook.

In some cases, "equipment modification" may not mean the actual alteration of an existing piece of equipment, but the judicious selection of standard equipment or the addition of an auxiliary piece of equipment to an existing device. A careful review of equipment catalogs may reveal items that are lightweight, are shaped to allow an easy grasp, are automatic or semiautomatic, can be used with somewhat imprecise movements, have large or high-contrast markings, or for some other reason are well-suited for a particular person. Examples include electric staplers for the weak or poorly coordinated; electronic calculators with large displays for the visually impaired; automatic center punches that allow markings to be made on wood, metal, or other materials requiring use of only one hand; and office equipment in colors that take advantage of residual visual capabilities.

The use of auxiliary equipment may be illustrated in the case of telephone aids that allow normal telephone use by those whose movement capabilities are restricted. Semiautomatic dialers that dial numbers from preprogrammed cards are available for those lacking the dexterity needed to use the usual dial or pushbuttons. Similarly, headsets and mounts that hold handsets, which eliminate the need to pick up the receiver when making or receiving a call, are available. Modifications designed specifically to overcome sensory limitations are discussed in the section on barriers to communication. Devices that allow typewriter operation by persons with a variety of physical impairments are also discussed in the communications section; as pointed out there, the alliance of the keyboard and the computer opens a wide range of possibilities to the mentally able, physically impaired worker.

An example of the wedding of well-chosen standard equipment to an auxiliary apparatus is given by Hillam (1975). Hillam, a quadriplegic who pursues photography as a hobby, selected a fully-automatic 35mm single lens reflex camera equipped with a cable release and mounted it on his wheelchair so that the latter functions effectively as a tripod. This system eliminates the need for making most of the camera adjustments typically required for high quality photography.

SPECIAL TOOLS, PROSTHESES, AND OTHER AIDS

Sometimes job activities cannot be eliminated. In other cases, it may be undesirable to alter a work environment even if it is technically possible to do so. For example, many craftsmen move from bench to bench to complete various tasks. While it is easy to lower a bench for a person in a wheelchair, to do so poses an inconvenience for nonhandicapped coworkers; to lower one or two benches would restrict the handicapped worker to the one or two tasks performed at the lowered benches. In this case, adjustable wheelchairs could be provided that would raise the worker to the level of the benches (example given by A. G. Garris in Rehab Roundup, California Department of Vocational Rehabilitation, January 1974).

Similarly, if the handicapped worker must use tools designed for the nonhandicapped, special aids may be needed. Often, standard prostheses will be satisfactory; in other cases, more sophisticated appliances may be needed, for example, the "powered hook" (Hildred, 1973) that allows the operation of many standard tools (such as electric drills with "trigger" motor controls) by upper-limb amputees.

Other powered prostheses have been developed. While it is beyond the scope of this section to review this area in detail, the "Boston Arm," an EMG-controlled prosthesis (Mann, 1970, 1974), is particularly interesting. This device allows synergistic movements of the arms as well as more accurate limb positioning without visual guidance than is possible with traditional prostheses. Such a prosthesis should help to open jobs requiring two-hand coordination and delicacy in the placement of objects, particularly in jobs requiring the worker, for example, to reach for and operate controls while attending to gauges, meters, or other signals.

For those with partially paralyzed upper-limbs, recent advances in upper-limb orthoses (Hildred, 1973; Staros & Peizer, 1975) promise to provide lighter devices. These devices would more nearly match normal hand and finger motions, allowing the use of an increasing number of tools and equipment, particularly those items that require fine motor skills in the operation of controls.

Besides prostheses and orthoses, a wide variety of devices can be developed or employed to help the handicapped person succeed on the job. The number of situations that may arise, and the variety of solutions that may be developed, are so nearly limitless that it is not possible even to attempt to deal with them exhaustively. Following are a few examples:

1. bookstands with automatic page turners for the physically handicapped who need to make frequent reference to printed materials;
2. headwands, mouthsticks, pointers, and other probes for pushing buttons and similar controls by those who cannot reach them unaided;

3. devices similar to croupier sticks for drawing items toward the person who cannot reach them unaided;

4. devices used for lifting objects from high or low shelves such as the "E-Z Reacher," which allows objects to be grasped with opposed suction cups mounted on metal fingers at one end of a tube (the user adjusts the distance between the metal fingers by squeezing a trigger, thereby grasping or releasing objects); and

5. a dental aspirator and pump to draw off the liquid of a person with uncontrollable salivation, thereby preventing the saliva from falling on items in the work areas (example given by A. G. Garris in Rehab Roundup, California Department of Vocational Rehabilitation, May 1975).

JOB REDESIGN

The way in which job duties are performed or the activities assigned to particular workers in performing them are often determined as much by tradition as they are by what really needs to be done. There are at least three ways to overcome this problem: (1) reassign duties so that the strengths of each worker are capitalized upon and the importance of the worker's limitations are minimized--this can apply to the strengths and limitations of all workers, not just the handicapped; (2) alter the specific activities required so that the same duties are performed, but in a different way; and (3) entirely eliminate activities that are not really necessary for accomplishing the job. An example of each is given below. As with some of the strategies discussed earlier, the variety of situations and solutions is almost limitless; therefore, no attempt is made to be comprehensive.

REASSIGNMENT OF DUTIES

A machine operator who faces difficulties in fetching raw materials or in removing finished products to a central repository (because of blindness or an orthopedic impairment, for example) might be freed from these duties which, in turn, could be assigned to someone else. This other person could serve several machine operators, thereby increasing the number of products produced by freeing the skilled (and probably higher paid) employees from the need to leave their work stations.

ALTERATION OF WORK ACTIVITIES

Kidd (1971) provides an example of retarded workers who packed 100 items into cartons. As designed for nonretarded workers, this duty required counting to 100, which the retarded workers could not do. The activity was altered; instead of counting 100 objects, retarded workers simply placed an item in the carton with one hand while removing a token from another container with the other hand. The second container began with 100 tokens; when it became empty (which, of course, was when 100 items were placed in the carton), the entire procedure was repeated with the next carton.

ELIMINATION OF UNNECESSARY ACTIVITIES

Housman and Gentile (1972) provide an example showing how unnecessary activities can be eliminated. In this case, homebound clerks received calls reporting teacher illness and arranged for substitutes. Because the clerks were allowed to work at home, the activities associated with securing transportation to a central office were eliminated.

Barrier 4.0 Skills

Most nonhandicapped persons have access to a variety of vocational education opportunities that allow them to learn the skills, behaviors, and competencies needed to function on a job. They are able to obtain diplomas, certificates, or licenses that are prerequisite to certain vocations. Most persons with severe handicaps do not, for a number of reasons, profit from these vocational education opportunities and find it difficult to obtain adequate training to engage competitively in the economy. Adequate performance in a vocation presupposes several sets of skills other than the vocational, for example, independent living skills, basic education skills, and work adjustment skills.

Functional Barrier 4.1 LACK OF INDEPENDENT LIVING SKILLS

In order for the handicapped worker to independently maintain himself/herself outside of a sheltered environment, the following kinds of skills must be mastered: self-bathing, using the toilet, clothing oneself, cooking, maintaining a household, taking care of emergencies, handling medical problems, handling money, caring for recreational needs, participating in a family, and so on. Handicapped persons often require intensive training in independent living skills as well as special training with mobility aids or prosthetic devices.

STRATEGIES FOR OVERCOMING THIS BARRIER

SHELTERED WORKSHOP TRAINING

Most sheltered workshops provide handicapped persons with training in independent daily living skills. For example, a four-month home economics training program, called Greentree School, was given to chronic schizophrenic women to help them cope with some of the everyday problems that they would encounter following discharge from the hospital. Women were trained in a variety of homemaking skills including selection and care of clothing and home furnishings, management of time and money, and child care (Central Hospital, Lakeland, Kentucky, 1971). The Sacramento Society for the Blind established an intensive five-week vocational course for young adults aged 15 to 20 years. The five-week course included part-time work experience, daily living instruction, and job placement (Laurence, 1973). The Hot Springs (Arkansas) Rehabilitation Center provided training in advanced living skills including driver education, recreational activities, vocational tutoring and evaluation, personal and social adjustment, and independent living (Rice & Milligan, 1973). Behavior modification techniques have been used to normalize personal appearance, speech, eating behaviors, and socialization, as well as to reduce deviant behaviors (Brickey, 1974).

OFF-CAMPUS OR HALFWAY HOUSE TRAINING

These settings utilize a more realistic environment to reinforce the mastery of independent living skills. For example, clients at the Sunland Training Center for Retarded Persons in Miami were given vocational and psychosocial evaluations; then a multidiscipline team developed independent rehabilitation plans for them that included independent living skills. After vocational and community orientations, clients received six weeks of basic on-campus vocational training and about 12 weeks of intensive off-campus training. Campus facilities included 30 job-training stations and a sheltered workshop; off campus were seven workshops and 20 on-the-job training programs (Cortazzo & Runnels, 1970).

HOMETRAINING

Most nonhandicapped workers learn independent living skills in the home. In many cases, handicapped persons also learn these skills in the home. Stewart (1971) has pointed out some problems of the severely handicapped deaf and the educational implications of these problems. Data on 106 deaf clients at the Hot Springs Rehabilitation Center in Arkansas show that the major impediments to rehabilitating these students are impoverished communication skills; behaviors that are inappropriate, inadequate, and impulsive; low levels of interest; and a lack of special services and trained staff to work with the severely handicapped deaf. As a result of these findings, one need that Stewart cites is better family interaction with young deaf children.

PUBLIC EDUCATION

As mainstreaming programs are developed, public education systems will be required to teach independent living skills to handicapped students. Luckey and Addison (1974) point out the necessity of redefining "education" to include the development and application of such skills as toilet training, dressing, grooming, and communication, particularly for severely retarded children.

JOB MODIFICATION

Another approach to this barrier has been to modify the job so that independent living skills are not required. Some work can be done at home, for example, telephone sales work or dispatching taxis or service vehicles. Zamochnick (1973) points out the problem of overtrained cerebral palsied individuals who cannot perform a professional job because of physical dependency. He suggests the development of jobs specifically for people in this category.

Functional Barrier 4.2 LACK OF BASIC EDUCATION SKILLS

The U.S. system of education currently operates so that those who learn the fastest are given the most education. It is unreasonable to expect handicapped persons to develop their maximum vocational potential in less time and with less assistance than that given nonhandicapped persons. In order to live independently in an industrialized society, every person must acquire certain fundamental knowledge. These skills, which are taught through formal education systems, are often unavailable to severely handicapped people because of their exclusion, for one reason or another, from the formal education systems.

STRATEGY FOR OVERCOMING THIS BARRIER

MAINSTREAMING Mainstreaming is the practice of establishing procedures to assure that, to the maximum extent appropriate, handicapped persons are educated with persons who are not handicapped and that special classes, separate schooling, or other removal of handicapped persons from the regular educational environment occurs only when the nature and severity of the handicap precludes regular classroom education with the use of supplementary aids and services. For example, the North Central Institute's Program for Hearing Impaired Adults is mainstreaming deaf persons into ongoing occupational training programs. Instructional materials were developed to improve the vocabulary abilities of the deaf. Because signing had not been used as an instructional technique in many vocational areas, 8mm silent loop films with accompanying student workbooks, each consisting of about 100 words, were developed for a specific instructional area. The films, showing the sign and the printed word along with the equipment being identified, were developed for the following areas: printing, keypunching, account clerk, auto body, math, drafting, nurse's aide, business machines, blueprint reading, machine tools, filing, and sewing. Instruction is provided in orientation and mobility, personal and home management, and communications and work adjustment services. Students attend a 16-week prevocational phase, after which they enter occupational training programs, attend other institutions of higher education, obtain employment, or enter some other planned program (Lambert, 1975).

Functional Barrier 4.3 LACK OF WORK ADJUSTMENT ATTITUDES, SKILLS, AND CAPACITIES

Any worker must have a variety of work adjustment attitudes, skills, and capacities in order to succeed. The handicapped worker may have special problems because of restricted experience caused by the handicapping condition. Work adjustment attitudes, skills, and capacities include psychosocial skills (e.g., consistent and stable acceptable behavior; self-control over destructive, disruptive, inappropriate, or antisocial behavior); physical capacities (e.g., gross dexterity of hand and large arm muscles; good health; resistance to fatigue over time); critical performance skills (e.g., ability to follow directions or procedures; ability to adapt to changes in assignments, instructions, and procedures; ability to understand conversation, directions, and instructions as they relate to learning and performing assigned work); and work behavior and attitudes (e.g., an ability or willingness to listen to and make a genuine effort to follow through with supervisor instructions, suggestions, and directives; the desire and effort to work; a willingness to work at a task until it is completed).

STRATEGIES FOR OVERCOMING THIS BARRIER

WORK SIMULATION, CONDITIONING, AND EXPERIENCE

Most rehabilitation and training programs for the severely handicapped include work simulation, work conditioning training, or actual work experience. These methods are designed to allow the student to practice working, with some sort of incentive as payment, in order to build up work tolerance. For example, the Work Experience Center operated by the St. Louis Jewish Employment and Vocational Service has developed a reality-oriented habilitation workshop designed for those who have never known the world of work. In order to help prepare clients for community living, the habilitation workshop attempts to give clients job-site as well as workshop experience (Bitter & Bolanovitch, 1966). As a second example, Fountain House in New York established a halfway house for deaf psychiatric patients (Bean & Beard, 1975). Deaf persons referred from the Rockland State Hospital are provided a variety of vocational opportunities. The Temporary Employment Placement Program provides semi-sheltered community employment so that clients can learn good work habits and become acclimated to the world of work before leaving the house. Jackson (1971) reported a pilot project in Austin, Texas, that was designed to serve severely retarded persons who were ineligible for regular vocational rehabilitation programs. Fifteen severely retarded adults were first extended sheltered workshop employment opportunities, including personal-social adjustment training, work adjustment training, and on-the-job training in assembly work; they were then offered community living services at two halfway houses. During the pilot program's first five months, occupancy rate was nearly 100%; monthly earnings per client ranged from $6 to $25, with an average of $8. Trybus and Lacks (1972) reported that the Behavioral Training Unit of the Work Experience Center in St. Louis, mentioned above, used operant-based behavior modification techniques in a project designed to teach work adjustment skills to 19 moderately to severely retarded adolescents who were unable to work in a sheltered workshop because of their low productivity and unmanageable behavior problems. The group training used a token system, a set of cuing lights, and such reinforcers as food, money, break time, and attention from supervisors. The operant techniques were successful in reversing work-interfering behaviors and in increasing productivity. It appeared that the controlled environment needed to be maintained for the improved behavior and performance to persist.

SUPPORTIVE COUNSELING

Another widespread technique used to overcome this barrier is supportive counseling. An example is the Young Adult Institute and Workshop of New York City, which provided an Adjustment Center for mentally retarded and otherwise disadvantaged persons over the age of 16. Most of the students served were multiply handicapped and were not yet in job training programs. The Adjustment Center provided small group counseling sessions in problem solving and change, social skills, communication skills, and employment skills. Individual counseling was provided as needed (Ames, 1970).

Functional Barrier 4.4 LACK OF VOCATIONAL SKILL DEVELOPMENT

Vocational training programs vary widely in scope, methods, the extent to which research is integrated into programming procedures, the extent to which business, labor, and industry are involved, and the training environment. Vocational skill, commensurate with the individual handicapped worker's goals and potential, is a prerequisite to job placement; thus, it can be an important barrier to employment and should be addressed.

STRATEGIES FOR OVERCOMING THIS BARRIER

INDIVIDUALIZED PROGRAMMED INSTRUCTION Most programs have some sort of individualized instruction. However, improvements in this area are suggested. Based on the findings of a state-wide assessment in Illinois, Szoke (1974) proposed the need for in-depth vocational assessment of handicapped students and for individualized programmed instructional materials. Szoke contends that "special needs" students can achieve the occupational competency of nonhandicapped students, though perhaps at a slower rate or with a different method.

PARAPROFESSIONAL TUTORS The paraprofessional role usually supplements the more formal aspects of vocational programming. The paraprofessional may be assigned the role of presenting content; supplying active tutorial assistance to individuals or small groups of students; serving a monitorial function to help maintain discipline and attention in a crowded or shared-teacher classroom or instructional setting; or serving as a practice agent to improve the value and facilitate the administration of learning activities. Craighead and Mercatoris (1973) have reported several projects that employ the mentally retarded as tutors. Generally, the mentally retarded tutors served as reinforcers for a specific target behavior in an experimental setting. Whether or not these paraprofessionals can work without extensive supervision, and thus conserve staff time, remains to be seen. Craighead and Mercatoris concluded, however, that their mentally retarded students exhibited the same learning curves when trained by retardates as when trained by staff, and that the major value of the programs accrued to the tutor.

MODELING One of the fundamental means by which new modes of behavior are acquired and existing patterns are modified entails modeling and vicarious processes. Research has demonstrated that virtually all learning phenomena resulting from direct experiences can occur on a vicarious basis through observation of others' behavior and the consequences of that behavior (Bandura, 1965). Thus, to illustrate, one can acquire intricate new learning merely by observing the performances of appropriate models; emotional responses can be conditioned through observation of the responses of persons undergoing emotional experiences; and the expression of well-learned responses can be enhanced and taught through the actions of influential models. Burleson (1973) reported the use of these techniques with a 38-year-old retarded, legally blind male. Institutionalized for 26 years, the client had previously avoided social interactions and refused teaching services. The modeling technique, used to reduce his anxiety and enable him to learn new skills, emphasized the primary sense modalities, particularly audition and tactile perception. Use of the modeling technique enabled the client to function at a significantly higher level, to improve his self-concept and social skills, and to attain employment in the community.

OPERANT BEHAVIOR MODIFICATION Many programs are using behavior modification techniques, particularly those dealing with the severely mentally retarded and the mutiply handicapped. The University of Oregon's

University Affiliated Facility and Rehabilitation Research and Training Center in Mental Retardation is developing specialized training programs for the severely and profoundly retarded in an effort to reduce the amount of time needed to acquire vocational skills and improve productivity in the work place. This behavior-oriented program has developed methods of training retarded persons to discriminate and then attend to relevant dimensions of the task through a series of simple-to-difficult discriminations. Practical applications have been made to such relatively complex tasks as assembling bicycle parts. Various approaches have emphasized diversifying the supervisor instructions (Bellamy, 1976), enriching the training (Gold, 1972), giving verbal instructions to correct errors during the original learning (Gold & Barclay, 1973), determining the effects of a realistic working environment on base rates of performance (Brickey, 1974), and so on. Yarbrough (1972) reports an automated system that was used to monitor behaviors in a sheltered workshop. Tools wired to an operant programming and recording apparatus were used to transduce behaviors; the task consisted of constructing electronic equipment. As a result of this monitoring technique, it was reported that a great deal of objective information was available to help the supervisor measure the client's progress.

WORK EXPERIENCE

Work experience obtained on the job is a very widespread method used to increase vocational skills. The techniques vary from simulated work experience in a sheltered workshop to on-the-job training conducted by the business or industry itself. An example is the program that was used by Abilities, Inc. of Florida (1966). Patterned after a similar organization located in Albertson, New York, Abilities, Inc. of Florida provided employment in a competitive work environment in the manufacture of electronic equipment, direct mail advertising, and printing. Contracts for work at the center were secured with private businesses. Generally, applicants were required to work at the center, although part of the direct mail operation was handled by homebound employees. The ages of employees ranged from 22 to over 60. Employees had a wide variety of physical impairments (e.g., mental retardation, amputation, polio, arthritis, and congenital abnormalities). Employees worked a standard work day and received wages and benefits comparable to prevailing local rates. Some of the jobs done were soldering, fabrication, and assembly of electronic equipment; operation of mechanical addressing and folding equipment; compilation of mailing lists; operation of letterset and offset presses; and binding, platemaking, and layout.

In an effort to reflect current employer needs and trends in competitive employment, the center's training programs were reviewed by experts in industry, government, and education. Between 1960 and 1966, Abilities, Inc. trained approximately 200 people, most of whom had been referred by state vocational rehabilitation agencies. About one-third of them were rehabilitated, and the remainder were referred to sheltered workshops and other agencies.

Another example of work experience obtained on the job is the Projects with Industry program funded by the Social and Rehabilitation Service. This placement-oriented program offers to the disabled employment opportunities ranging from manual labor to professional work in over 500 firms. Rehabilitation agencies and business firms implementing the program are Cole National Corporation; International Business Machines Corporation; MacDonald Training Center in Tampa, Florida; the Easter Seal Goodwill Industries Rehabilitation Center in New Haven, Connecticut; the Chicago Jewish Vocational Services; the Human Resources Center in Albertson, New York; and Fountain House in New York City. During the latter half of 1973, 62% of the 1,724 disabled persons served were placed on jobs. The cost of each placement was $1,000, as opposed to $2,137 in the state/federal vocational rehabilitation program.

Still another example of on-the-job work experience is a three-year demonstration project conducted by the Special School District of St. Louis County (the Missouri State Division of Vocational Rehabilitation) and the St. Louis Jewish Employment and Vocational Service. The program trained clients between 16 and 21 years of age with IQs ranging from 40 to 65. Clients entered a five-phase program including (1) general evaluation and vocational adjustment (intramural), (2) job-site evaluation and vocational adjustment (extramural), (3) specific job preparation and/or occupational training, (4) job placement and tryout, and (5) employment and follow-up. As a result of this project, staff stressed the need for extramural programming that includes community and industrial resources.

DRUG THERAPY

For seriously emotionally disturbed workers, clinical control of symptoms and enhanced work performance is achieved by the use of appropriate drug therapy. Chacon, Harper, and Harvey (1972) reported a study in which the work performance of 34 male chronic schizophrenics was tested over a 12-week period to compare the effects of two drugs, chlorpromazine and fluenazine decanoate, and a placebo. Results showed a significant increase in performance on a complex task when the subjects were receiving fluenazine decanoate.

SYSTEMS APPROACH

Banathy (1973) defined a system as an interacting group of entities forming an organized whole. More specifically, it is a deliberately designed synthetic entity made up of diverse but interdependent components that interact and are united according to some organizing idea, plan, or central principle. A system becomes more than the aggregate of its components. Generally, the first step in establishing a system is to clearly define the output. In most cases, the output for vocational training and placement programs for severely handicapped persons is employability of the handicapped person. Employability can be defined at the outset as those behaviors one wishes to see expressed at the end of the program. Next, the person is evaluated to see what behaviors she/he is lacking and then a step-by-step course is outlined for the client to follow to reach the desired ends. Feedback loops are built into the system so that the course can be corrected, and the process is continued until the outcome is reached. Emphasis is placed on defining all needed components to achieve the desired outcomes, and each component's function is articulated within the whole system.

An example of the systems approach applied to the vocational training and placement of the severely handicapped is that of the San Antonio Goodwill Rehabilitation Services' Competency Model Program (Lippman & Porter, 1976). Employability, designated as the ultimate goal for all clients, was defined as concrete, observable behaviors in three components: (1) physical/sensory capabilities; (2) social/emotional characteristics; and (3) functional education skills. Competency in these areas was established in terms of local norms required for the San Antonio community. Clients were identified as handicapped when there was an absence of required competencies. Proficiency levels were established for each desirable behavior on a scale from 1 to 5. Level 1 indicated an absence of the desired skill or behavior, and level 5 indicated proficiency in the desired skill or behavior. Task analyses were undertaken to determine the method to be used to attain competency in desired behaviors for each individual. Activities were sequenced to achieve the desired behaviors with frequent individual monitoring to determine progress toward mastery. Documentation of progress was a part of the rehabilitation process.

An example of the systems approach applied to curriculum materials for the severely handicapped is a curriculum guide to seven para-cosmetologist occupations for the physically handicapped. The guide was prepared by the UCLA Division of Vocational Education in cooperation with the Bureau of Industrial Education and the California State Department of Education. Behavioral objectives are presented for each identified task and are written in a format that stresses clarity. The information to be presented, the desired student performance, and the final standard performance are all identified. Estimated instructional hours varied from 75 to 500 for each of the occupations (University of California at Los Angeles, 1971).

REORGANIZATION OF PROGRAMS INTO MULTIAGENCY CENTERS

Greenleigh Associates (1969) proposed a model program to serve handicapped people who are potentially employable. The program would include training stipends, guaranteed job placement in manpower training programs, flexible training techniques, sheltered workshops for work evaluation, and work adjustment and pre-employment training. Greenleigh Associates recommended that existing agencies be reorganized into multiagency centers. Their recommendation was based on the fact that many agencies do not have the resources to predict the changing labor market or the range of medical, social, and financial capabilities necessary to serve the handicapped effectively.

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worker trait group tables

DESCRIPTION OF TABLES

This section of the handbook contains 65 tables based on worker trait group information that appears in Volume II of the Dictionary of Occupational Titles (DOT) and on a survey conducted as part of the VOTAP project. Figure 1 shows a sample table and explains each type of table entry. As noted in Figure 1, the two entries at the top of each table give the name of the worker trait group and a summary of the tasks typically performed by persons working at jobs in that group; these entries are direct adaptations of material in the DOT. Three-digit numbers associated with each worker trait group indicate the level of sophistication required by those working at jobs in the group in relation to data (the first digit), people (the second digit), and things (the third digit). Digits in each position can take values from 0 to 6 or 7, with lower values generally signifying more sophisticated relationships, and the higher values signifying less sophisticated relationships. The significance of each value is discussed in the Appendix. Many of the worker trait groups have more than one three-digit number associated with them, while others have a single three-digit number; the former case has more heterogeneity among jobs and demands placed on workers than the latter case.

In each table, the entry labeled "Jobs Held by Handicapped Workers" shows jobs that handicapped workers are now holding as revealed by the 169 VOTAP survey respondents. As this is a relatively small sample, table entries should not be taken to constitute a complete compilation of jobs performed by the handicapped; most readers probably know of persons succeeding at jobs not included on these lists. The purpose of these lists, taken together, is to document that a wide variety of jobs are within reach of severely handicapped people, and to encourage the exploration of a wide variety of jobs by the handicapped person, the counselor, and the trainer. The fact that a job is not listed does not infer that handicapped persons could not fill that job; such an inference would be contrary to the purpose for which these lists are intended.

The "Other Jobs in This Group" entry lists selected additional jobs in the same worker trait group. The purpose of this entry is to show the variety of jobs of a similar level of sophistication that place similar demands on the worker. No doubt, many of these jobs are already being performed by handicapped persons who were not known to VOTAP survey respondents. In any case, handicapped persons with interests and abilities in fields specified by the worker trait groups will find these jobs well worth exploring. The Appendix discusses how the DOT can be used to "branch out" into additional worker trait groups.

The "Opening Jobs in This Group" entry discusses the barriers that a handicapped person may face in securing training or placement. A previous section of this handbook discusses strategies for overcoming these barriers. The fact that a barrier is mentioned in this entry does not imply that it will be faced by every handicapped person seeking a job in that worker trait group. The seriousness of the barriers mentioned depends on the individual's handicapping condition, the building in which the work is to be performed, the feelings and conduct of co-workers, the adroitness of the handicapped person in making himself or herself understood or in putting others at ease, and a host of other factors unique to the specific situation.

To summarize, the purpose of the tables that follow is to provide a sample of the vide variety of jobs in which handicapped people are now employed; to point out similar jobs for investigation by the handicapped person or by a professional working with that person; and to direct attention to strategies that may be used to overcome certain barriers.

FINDING JOBS

This handbook can be used to help identify jobs for the severely handicapped. The essential steps are to determine (1) the behavioral repertoire of the handicapped person, (2) the interests and vocational aspirations of the handicapped person, (3) the local job possibilities which interest the handicapped person, (4) the job demands to which the handicapped person must be capable of responding, and (5) the strategy that is necessary to reinforce, augment, or supplement the person in order to manage her or his deficit.

The idea is not simply to match the person and the occupation. The role of the training or placement officer is to be more than a trainer, counselor, or job finder. He or she becomes a strategist with many possible options, for example, to select jobs in which the client's deficit is irrelevant, to provide special training, to enhance the person's capabilities with an assistive device, and to reengineer the job. The worker trait group tables in this handbook will give the training or placement officer a very good idea of the types of jobs that severely handicapped people are presently performing. The worker trait group tables also describe the most likely problems and some strategies that can be used to overcome the problems.

The following example, based on the Peterson and Jones (1976) approach, illustrates how steps 1 through 5 described above might be achieved.

1. Prepare a client profile that contains three types of summary information.
    - Job activities for which the client has been trained, with an estimate of her or his performance on each of them.
    - Personal characteristics of the client as determined by personal observation, tests and evaluations, work samples, etc.
    - Client interests and estimates of motivation for employment. Client and parent interests and ambitions, if realistic, should play an important part in placing the clients in a suitable job.
2. Identify client patterns of job ability from the client profile, determining patterns of strengths and weaknesses in both job activities and personal characteristics. These patterns may suggest job-related patterns. However, since the client may have been exposed to a wide variety of job activities in training rather than being trained for a given job, it may be difficult to identify a job-related pattern.
3. Compare client patterns with the jobs described in the handbook's worker trait group tables; seek jobs in which the client's strengths will be an asset and her or his weaknesses will not cause problems, or seek jobs in which weaknesses may be reduced by more specific job training. Job orientation and on-the-job training may substantially contribute to the client's effectiveness.

4. When one or more potential jobs have been identified, systematically review the client's capabilities, limitations, and interests with a specific job in mind. Begin with the job that seems to match the client's patterns most closely. Ask the following kinds of questions:

   - Where does the client match the job, and what does she or he lack most?

   - Are the deficits critical to probable job success?

   - Will the employer be likely to accept the client with these deficits?

5. Determine whether some or all of these deficiencies can be made up in some way. Refer to the barriers section of this handbook for possible strategies for overcoming these barriers.

6. Discuss the barriers and strategies with your client to determine how he or she would like to approach management of the barriers. Depending upon the client's suggestions, you might meet with employers, state rehabilitation counselors, special education counselors, or other resource people to develop a strategy for successfully placing your client.

USING THE DOT

A person concerned with the placement of the handicapped may find the DOT a useful supplement to the worker trait group tables in this handbook. Volume I of the DOT contains directions for its use in occupational exploration as well as interviewing, counseling, and placing applicants for employment (pp. XXII-XXIV). These directions apply both to handicapped and nonhandicapped persons and are particularly appropriate when seeking a job for a handicapped person in which her or his deficit is irrelevant. The Worker Trait Group tables in Volume II of the DOT provide clues for possible training, skill augmentation, and job reengineering to improve vocational possibilities. For examples of how information from the DOT may be applied, see the Appendix.

List of Worker Trait Groups in Which the Severely Handicapped Are Employed,
as Reported by VOTAP Survey Respondents

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.268	News Reporting and Related Work	83
.258, .358, .458	Demonstration and Sales Work	84
.271, .371	Beautician and Barbering Services	86
.268, .368	Secretarial and Related Work	87
.280, .380	Set Up and/or All-Round Machine Operating	88
.281, .381	Cooking and Related Work	89
.281, .381	Craftsmanship and Related Work	90
.282, .382	Radio and Television Transmitting and Receiving	92
.288	Technical Writing and Related Work	93
.288	Translating, Editing, and Related Work	94
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.368	Information Gathering, Dispensing, Verifying, and Related Work	96
.368	Paying and Receiving (banks and other establishments)	98
.368, .378	Nursing, X-Ray, and Related Services	99

.382, .384 .387, .484, .487	Inspecting and Stock Checking	100
.382, .582	Typesetting, Reproducing, and Related Machine Work	102
.384	Technical Work, Science and Related Fields	103
.388	Classifying, Filing, and Related Work	104
.388	Corresponding and Related Work	106
.388	Stenographic and Related Work	107
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.468	Cashiering (drug stores, theaters, restaurants, and related establishments)	110
.468, .478	Customer Service Work, N.E.C.	111
.484, .485, .487, .584, .585, .587, .683, .684, .685, .687	Sorting, Inspecting, Measuring, and Related Work	112
.588	Typing and Related Recording	114
.858	Selling and Related Work	115
.588, .688	Routine Checking and Recording	116
.781	Precision Working	118
.782	Operating--Controlling	120
.862	Switchboard Service	122
.863, .864, .865, .867, .873, .874, .877	Miscellaneous Customer Service Work	123
.868, .878	Ushering, Messenger Service, and Related Work	124
.874, .877	Animal Care	125
.868, .878	Protecting and Related Work	126
.883	Driving--Operating	127
.868, .878	Miscellaneous Personal Service Work (food serving, portering, valeting, and related activities)	128
.878	Child and Adult Care	130
.884	Manipulating	132
.886	Feeding--Offbearing	135
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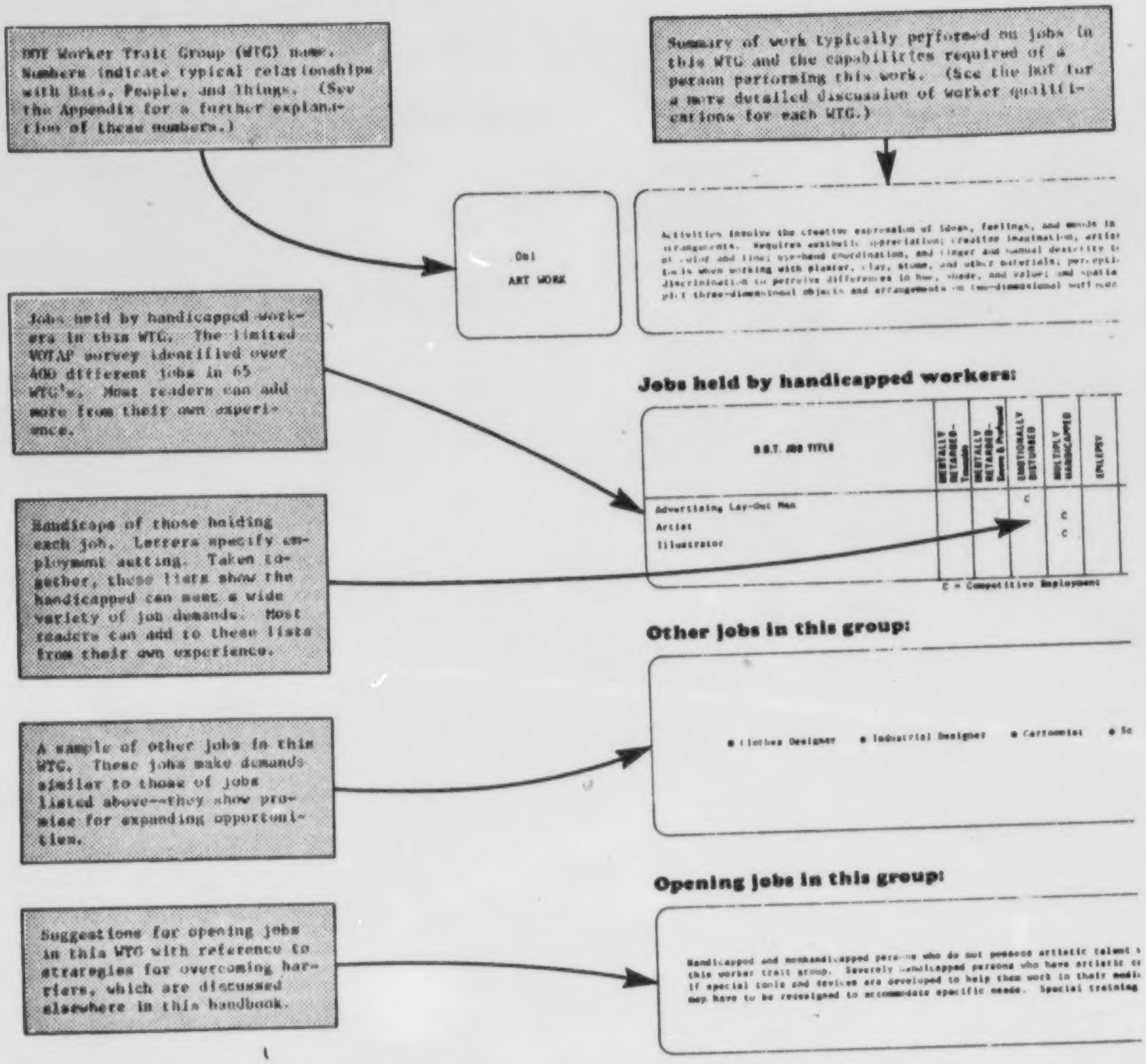

DOT Worker Trait Group (WTG) name. Numbers indicate typical relationships with Data, People, and Things. (See the Appendix for a further explanation of these numbers.)

Summary of work typically performed on jobs in this WTG and the capabilities required of a person performing this work. (See the DOT for a more detailed discussion of worker qualifications for each WTG.)

Jobs held by handicapped workers in this WTG. The limited VOTAP survey identified over 400 different jobs in 65 WTG's. Most readers can add more from their own experience.

Handicaps of those holding each job. Letters specify employment setting. Taken together, these lists show the handicapped can meet a wide variety of job demands. Most readers can add to these lists from their own experience.

A sample of other jobs in this WTG. These jobs make demands similar to those of jobs listed above--they show promise for expanding opportunities.

Suggestions for opening jobs in this WTG with reference to strategies for overcoming barriers, which are discussed elsewhere in this handbook.

.081

ART WORK

Activities involve the creative expression of ideas, feelings, and moods in
arrangements. Requires esthetic appreciation; creative imagination, artis
of color and line; eye-hand coordination, and finger and manual dexterity t
tools when working with plaster, clay, stone, and other materials; percepti
discrimination to perceive differences in hue, shade, and value; and spatia
pict three-dimensional objects and arrangements on two-dimensional surfaces

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY
Advertising Lay-Out Man			C		
Artist				C	
Illustrator				C	

C = Competitive Employment

Other jobs in this group:

● Clothes Designer ● Industrial Designer ● Cartoonist ● Sc

Opening jobs in this group:

Handicapped and nonhandicapped persons who do not possess artistic talent s
this worker trait group. Severely handicapped persons who have artistic c
if special tools and devices are developed to help them work in their medi
may have to be reassigned to accommodate specific needs. Special training

Figure 1. Sample Worker Trait Group Table.

.081
ART WORK

Activities involve the creative expression of ideas, feelings, and moods in artistic designs, objects, and arrangements. Requires aesthetic appreciation; creative imagination; artistic judgment concerning harmony of color and line; eye-hand coordination, and finger and manual dexterity to paint or draw and to use hand tools when working with plaster, clay, stone, and other materials; perception of form and design; color discrimination to perceive differences in hue, shade, and value; and spatial aptitude to visualize and depict three-dimensional objects and arrangements on two-dimensional surfaces. (DOT, Vol. 2, p. 232)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Advertising Lay-Out Man			C								
Artist				C							
Illustrator				C						C	

C = Competitive Employment

Other jobs in this group:

- Clothes Designer
- Industrial Designer
- Cartoonist
- Sculpter
- Sign Writer

Opening jobs in this group:

Handicapped and nonhandicapped persons who do not possess artistic talent will be excluded from jobs in this worker trait group. Severely handicapped persons who have artistic capabilities may find employment if special tools and devices are developed to help them work in their mediums. In some cases work places may have to be redesigned to accommodate specific needs. Special training may augment skills.

.081

ENGINEERING
RESEARCH AND
DESIGN

Activities primarily involve using and adapting earth substances, properties of matter, natural sources of power, and physical forces to satisfy human needs and desires. Requires ability to learn and apply basic engineering principles and methods; good visual acuity with respect to graphic representations; creative talent or imagination; ability to perceive or visualize spatial relationships of plane and solid objects; logical mind; organizational ability; and facility in mathematics. (DOT, Vol. 2, p. 371)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Electrical Engineer										C	
Civil Engineer								C			
Construction Engineer								C			
Tool Designer							C				
Petroleum Engineer								C			
Photographic Engineer								C	C		

C = Competitive Employment

Other jobs in this group:

- Architect
- Electrical Engineer
- Civil Engineer
- Chemical Engineer
- Mining Engineer
- Nuclear Engineer

Opening jobs in this group:

Jobs in this worker trait group require capability and sophistication in dealing with data and objects, and both handicapped and nonhandicapped persons who are not gifted with intellectual skills and the ability to do precision work will be excluded from these jobs. The orthopedically handicapped, cerebral palsied, severe health impaired, and blind may find employment if special training is provided and if communication and mobility barriers are overcome. Mobility and manipulation barriers will probably be the most difficult for the orthopedically handicapped to overcome.

.088, .188

MATHEMATICS, PHYSICAL SCIENCES, AND RELATED RESEARCH

Work activities primarily involve investigation into atmospheric, astronomical, and geographical phenomena and conditions, into theoretical aspects of physics and mathematics, and into automatic data-processing systems and programs. Requires the ability to understand the basic laws of nature and scientific methods of investigation; inventiveness; ability to represent and relate abstract ideas by means of symbols; organizational ability; retentive memory; clerical perception; lucid verbal expression; ability to grasp mathematic and statistical concepts. (DOT, Vol. 2, p. 468)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Financial Analyst									C		
Programmer						C		C			
Programmer, Business			C					C			
Programmer, Engineering and Scientific								C			
Programmer, Technical							C	C		C	
Statistical Researcher										C	
Statistician									C		

C = Competitive Employment

Other jobs in this group:

Mobility aids, communication devices, and specially designed work stations will be likely means of opening jobs to handicapped persons with the requisite intellectual capacity for these jobs. It is unlikely that sufficient training will be available outside the formal education system; thus, handicapped workers should be capable of being mainstreamed into formal education systems.

Opening jobs in this group:

- Engineering Analyst
- Mathematician
- Statistian, Social Science
- Astronomer
- Physicist, Theoretical

.108

MEDICAL,
VETERINARY, AND
RELATED SCIENCES

Work activities primarily involve applying knowledge of medical science to the diagnosis, prevention, and treatment of human and animal diseases, disorders, and injuries. Requires intellectual capacity to comprehend a wide variety of subjects in basic medical sciences and college-level courses in humanities and social sciences; analytical ability; verbal ability; spatial perception; numerical ability; form perception; stamina to work long hours; and some finger dexterity. (DOT, Vol. 2, p. 473)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Psychiatrist								C			
Speech Therapist										C	

C = Competitive Employment

Other jobs in this group:

- Anesthesiologist
- Gynecologist
- Pediatrician
- Osteopathic Physician
- Dentist
- Orthodontist
- Veterinarian
- Audiologist
- Speech Pathologist

Opening jobs in this group:

Severely handicapped persons who possess the necessary intellectual capacity for these jobs still face many barriers. Long and extensive education is required and is probably unavailable except through mainstreaming. Public attitudes may be severe barriers. Some kinds of communication handicaps may be overcome with special devices. A lack of finger dexterity would prohibit some handicapped workers from participating in these jobs. Job redesign, suited to the specific ability of the individual, may open portions of these jobs to the handicapped worker.

.108, .118, .168

LEGAL AND RELATED WORK

Work activities primarily involve applying a knowledge of municipal, county, state, or federal laws to various phases of litigating and adjudicating. Requires the intellectual capacity to absorb legal training and to reason analytically when relating training and knowledge to legal problems; facility with language; the ability to relate to people; originality and persuasiveness in presenting arguments; and unwavering accuracy for complex, detailed work. (DOT, Vol. I, p. 425)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Lawyer, Patent								C			
Tax Agent							C				

C = Competitive Employment

Other jobs in this group:

- Claim Attorney
- Judge
- Appeals Reviewer
- Adjudicator

Opening jobs in this group:

Severely handicapped workers who have the necessary intellectual and verbal ability to undertake law school may be placed in legal jobs. However, one of the most severe barriers will be obtaining the required legal training. Communication handicaps may be sufficiently managed for the blind; for the nonvocal, however, the state of the art for communication devices may yet be too primitive. Jobs may be opened by job redesign; for example, legal research could probably be done by the nonvocal worker who can write. Because sophistication with objects is not required and the work is sedentary, legal jobs may be open to the orthopedically handicapped.

.108, .208

GUIDANCE AND COUNSELING

Activities primarily involve guiding and/or counseling individuals or groups in the solution of occupational, education, personal, or social problems. Requires a combination of sympathetic attitude toward the welfare of others; capacity to absorb training and apply knowledge to the solution of diverse problems; verbal facility to relate to people at all levels; organizational ability in order to plan and direct guidance programs; tact, poise, and general demeanor that tends to inspire confidence and esteem. (DOT, Vol. 2, p. 296)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Counselor (II, and Employment)								C	C	C	
Social Worker						C				C	

C = Competitive Employment

Other jobs in this group:

● Dean of Boys (Girls) ● Visiting Teacher ● Clergyman ● Caseworker

Opening jobs in this group:

Jobs in this worker trait group require high general intellectual and verbal capacities and the ability to communicate with people. Communication barriers may be overcome by various communication devices. Some jobs require considerable mobility, and thus may present a barrier to the handicapped worker. However, special devices may be used to aid mobility. Attitude barriers may be fewer in this field because of its social service nature.

.018, .038, .068

JOURNALISM AND EDITORIAL WORK

Activities primarily involve writing or editing material designed to induce specific actions, attitudes, or opinions; editing material designed to inform or amuse the public; or directing the policy and production of a publication or similar medium of communication or a department thereof. Requires facility with language and good vocabulary; originality and inventiveness; the ability to understand and relate to people; organizational ability; powers of persuasion; and attention to detail. (DOT, Vol. 2, p. 522)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Editor, Hospital Newspaper								C			

C = Competitive Employment

Other jobs in this group:

- Editor, Continuity and Script (radio and television broadcasting)
- Editor, Managing, Newspaper (printing and publishing)
- Columnist (printing and publishing)
- Editor, Book

Opening jobs in this group:

Jobs in this worker trait group require high verbal ability. This requirement cannot be avoided, and persons who do not possess verbal ability are effectively excluded from these jobs. The level of sophistication in dealing with people varies from merely talking with them to negotiating with them. There is no significant relationship to things; thus, jobs may be open to the orthopedically handicapped who have difficulty manipulating objects. Jobs may be opened by helping handicapped persons who possess verbal and writing capabilities overcome mobility and communication problems. Special training may augment skill development. Methods of overcoming attitude barriers are also appropriate.

.081

SCIENTIFIC
RESEARCH

Activities involve applying principles of chemistry, physics, metallurgy, and astronomy to (1) basic research designed to increase man's knowledge of the properties of matter and energy, (2) applied research designed to utilize the knowledge gained from basic research in order to develop new products and processes, and (3) the solution of practical research problems. Requires intellectual capacity and interest sufficient to acquire necessary academic background and to absorb and interpret scientific theories and data; thoroughness and penchant for detail; a facility with mathematics; and an inquisitive mind and fertile imagination. (DOT, Vol. 2, p. 466)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED–Trainable	MENTALLY RETARDED–Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Horticulturalist				C							
Microbiologist							C	C			

C = Competitive Employment

Other jobs in this group:

- Chemist
- Physicist
- Geologist
- Agronomist
- Biochemist
- Pathologist
- Veterinarian

Opening jobs in this group:

Jobs in this worker trait group demand the intellectual capabilities required for research. In addition, they require the ability to do precision work with objects. For workers who have the intellectual ability but are handicapped by communication or mobility barriers, special tools or devices tailored to their needs may need to be utilized, adapted, or erected. Job restructuring may minimize the need to manipulate objects by having someone else do these tasks. Special training may be useful in augmenting skills.

131

SUPERVISORY WORK
(farming, logging, manufacturing, processing, construction, transportation, and related activities)

Primarily involves supervising and coordinating the activities of workers in such fields as manufacturing, processing, construction, and transportation. Skill in the particular field of work and in the use of materials, tools, and machines involved is essential because workers are frequently required to participate in the work of their subordinates. Requires the ability to understand, learn, and apply the techniques appropriate to the field of work supervised; ability to communicate this knowledge; ability to demonstrate efficient technical "know-how"; initiative and drive; ability to maintain harmony among workers. (DOT, Vol. 2, p. 299)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Shop Foreman									C		

C = Competitive Employment

Other jobs in this group:

- Foreman, Bindery
- Foreman, Assembly Room
- Foreman, Assembly and Packing
- Foreman, Electronic Assemblies
- Foreman, Fabrication and Repair of Musical Instruments
- Film Technician (motion picture)
- Blue Printing-and-Photocopy Supervisor

Opening jobs in this group:

Severely handicapped people may have a variety of supervisory jobs open to them if they are able to do the work itself or if they have sufficient skill to direct others in work tasks. Supervisory jobs are open in many occupations; the specific barriers in each occupation need to be carefully analysed with respect to the capabilities of the individual handicapped worker. Communication devices, mobility devices, job redesign, and special training may all be useful.

.118, 168

ADMINISTRATION

Activities involve formulating and carrying out administrative principles, practices, and techniques in an organization or establishment. Requires organizational ability to plan, formulate, and execute policies and programs; capacity to acquire knowledge of various administrative concepts and to apply them; verbal facility; facility with numbers; ability to relate to people; flexibility to adjust to changing conditions; and an analytical mind to solve complex problems. (DOT, Vol. 2, p. 237)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Small Business Manager				C				C			
Curator						C					
Controller							C				
Hospital Administrator										C	
Data Analyst			C								
Regional Planner						C					

C = Competitive Employment

Other jobs in this group:

- Director of Guidance in Public Schools
- Director, Public-Health Nursing
- Academic Dean
- Principal (education)
- Director, Commission for the Blind
- Director, Educational Program
- Sales Manager
- Branch Manager
- Real Estate Agent

Opening jobs in this group:

Administrative jobs may be available to handicapped persons who possess the necessary intellectual and social abilities. Communication barriers would need to be well managed. Depending upon the specific job requirements, mobility barriers may be a problem. Basic education is a necessary requirement for most jobs. Special training may augment skill development. For many jobs, the barriers caused by negative public attitudes would be amenable to the strategies suggested in the barriers section of this handbook.

.138

SUPERVISORY WORK
(clerical, sales,
and related
activities)

Primarily supervise and coordinate the activities of personnel engaged in clerical, sales, and related work. Requires the ability to become familiar with at least one clerical or sales activity; ability to plan ahead; verbal ability, both oral and written; clerical aptitude; ability to motivate people to work cooperatively and conscientiously in activities that are frequently routine and repetitive; and ability to perform work done by subordinates and to train new employees when required. (DOT, Vol. 2, p. 243)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Telephone Operator, Chief										C	

C = Competitive Employment

Other jobs in this group:

● Personnel Clerk Supervisor ● Stenographic Pool Supervisor ● Computer Supervisor ● Payroll Clerk, Chief ● Supervisor, Messengers ● Supervising Film Editor (motion pictures; radio and television broadcasting) ● Production Supervisor (printing and publication)

Opening jobs in this group:

Supervisory jobs will he available to handicapped workers with the required abilities, providing they have mastered the work they are supervising. The wide range of jobs within this worker trait group suggests that the requirements of each job will necessitate an individual analysis of the demands of each one relative to the handicapped worker's capabilities. The ability to communicate effectively is critical to these jobs. Mobility may or may not be critical. Special training may augment skill development. Negative attitudes of others may require management.

.133

SUPERVISORY WORK
(service and
related activities)

Activities primarily involve supervising and coordinating activities of personnel engaged in serving or performing personal services for others. Requires the ability to become familiar with one or more service activities; ability to plan and direct activities; ability to communicate effectively; clerical perception to detect errors in records; ability to motivate people; and ability to perform duties of subordinates and train new employees. (DOT, Vol. 2, p. 461)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Housemother						E					
Steward, Banquet										C	
Dry Cleaning, Superintendent								C			

C = Competitive Employment

Other jobs in this group:

- Housekeeper, Home (domestic service)
- Kitchen Supervisor (hotel and restaurant)
- Waiter, Head
- Cook, Head, School Cafeteria
- Manager, Boarding House
- Baggage Porter, Head
- Caddie Master (amusement and recreational)
- Usher, Head (amusement and recreational)
- Animal Keeper, Head (amusement and recreational)
- Foreman, Maintenance

Opening jobs in this group:

A wide range of barriers may hinder handicapped persons in performing these jobs. These barriers include mobility or communication problems, lack of skill development, and public attitudes. However, when jobs are considered individually, many may be open to the handicapped worker. For example, a person with restricted mobility could be the manager of a boardinghouse if nonhandicapped persons were available to help. A nonvocal worker could give directions, plan, and organize with the aid of communication devices. Special training may augment skills.

.148, .268

RADIO ANNOUNCING
AND RELATED WORK

Activities primarily involve introducing radio and television programs and segments thereof; acting as master of ceremonies; verbally translating speech from one language to another; and giving running descriptions or commentaries of live-action events. Requires facility with language and good vocabulary; originality and inventiveness when speaking extemporaneously; ability to relate to an audience; pleasant speaking voice; and a good memory. (DOT, Vol 2, p. 400)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Radio Announcer							C				
Announcer (disc jockey)									C		

C = Competitive Employment

Other jobs in this group:

- Interpreter
- Motion Picture Narrator

Opening jobs in this group:

These jobs uniformly require a worker to be highly verbal and to have a pleasant, well-articulated voice; therefore, handicapped persons who are deficient in either intellectual or verbal ability, or who are nonvocal, will be excluded from these jobs. Some of these jobs may be excellent possibilities for persons whose mobility is restricted or who have cosmetic problems. Special training may be useful to augment skill development.

.168

ENGINEERING,
SCIENTIFIC, AND
TECHNICAL
COORDINATION

Work activities involve planning and coordinating engineering, scientific, and technical programs and activities. Requirements include the intellectual capacity to comprehend and apply engineering, scientific or technical principles and methods; organisational ability to plan, formulate, and carry out programs and policies; verbal facility to deal effectively with personnel; and mathematical ability. (DOT, Vol. 2, p. 375)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Project Director, Business Data							C				

C = Competitive Employment

Other jobs in this group:

- Chief Engineer (machine tools and accessories)
- Systems Analyst, Business Electronic Data Processing (professional and kindred)
- Draftsman, Chief, Design (light, heat, and power)
- Supervisor, Estimator and Draftsman (light, heat, and power)
- Programer, Chief, Business
- Chemical-Laboratory Chief
- Medical Technologist, Chief
- Airline Radio Operator

Opening jobs in this group:

A number of these jobs should be open to handicapped workers who have sufficient intellectual capacity and who have, or can attain, sufficient technical background. Many of the jobs appear not to be overly demanding in terms of mobility. Communication devices may be useful in assisting the nonvocal or the blind. Special training may augment skill development.

.168

MANAGERIAL WORK

Activities primarily involve organizing and coordinating the functions of a unit, department, or branch of an organization or establishment. Requires the ability to plan, initiate, and execute programs; ability to understand, interpret, and apply procedures and directives; numerical facility; leadership qualities; verbal facility; and the ability to relate to people. (DOT, Vol. 2, p. 245)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Manager, Warehouse										C	
Manager (unspecified)										C	
Manager, Store I							C				
Manager, Apartment House I										C	
Manager, Trainee			C								

C = Competitive Employment

Other jobs in this group:

- Dietician
- Department Head, College or University
- Librarian
- Musical Program Director (radio and television broadcasting)
- Auditor, Country or City
- Manager, Office
- Manager, Apartment House
- Manager, Convention
- Manager, Theater
- Casework Supervisor
- Conductor, Mixed Train

Opening jobs in this group:

With some exceptions, promotion from within is the most common method of filling positions in this group; therefore, handicapped persons will be required to demonstrate successful experience in applicable work at lower levels. Many of the jobs require preparation in pertinent coursework, such as business management; thus, special training may augment skill development.

.168

SCHEDULING, DISPATCHING, EXPEDITING, AND RELATED WORK

Work activities involve planning, coordinating, and expediting movement, activities, operations, and/or procedures inherent in the effectiveness of a variety of endeavors ranging from transportation and communications to production and recreation. Requires the ability to understand and apply procedures and regulations; ability to orally communicate technical or operational information; ability to evaluate and choose from alternate courses of action; spatial perception; organizational ability; ability to assume responsibility; clerical perception; and numerical ability. (DOT, Vol. 2, p. 261)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Dispatcher							C,S				
Dispatcher, Motor Vehicle							C				
Service Dispatcher							C				

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Train Dispatcher
- Air Traffic Control Specialist
- Travel Counselor
- Guide, Travel
- Dispatcher I (air transportation)
- Production Man (radio and tv broadcasting)

Opening jobs in this group:

A period of time up to four years may be required for an individual to become thoroughly familiar with the problems, techniques, and regulations involved in this type of work. Entry positions are commonly filled by promotion or reassignment from within. These jobs will be available to severely handicapped persons who possess the requisite intellectual ability and who are able to learn on the job. The first task will be to obtain a job which provides the necessary background experience. In many cases, jobs may be adapted to those with restricted mobility. Communication barriers may be irrelevant in some jobs, assuming that communicating and signaling can be done by remote control.

.168, .268

INTERVIEWING, INFORMATION-GIVING, AND RELATED WORK
(vocational, educational, and related activities)

Activities involve interviewing individuals in order to gather pertinent information; evaluating the information and/or the individual's qualifications for a variety of considerations; and dispensing information usually relative to the correct interpretation of rules and regulations governing such matters as insurance, education, or housing. Requires verbal facility to converse with people at varied levels; ability to deal tactfully with people; numerical ability and clerical perception; ability to reason analytically and to organize facts when asking and answering questions; a neat appearance, poise, and composure. (DOT, Vol. 2, p. 250)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Interviewer (unspecified)								C			
Employment Interviewer							C	C			

C = Competitive Employment

Other jobs in this group:

- Director, Casting
- Placement Officer
- Claims Taker, Unemployment Benefits
- Secretary, Board-of-Education
- Examination Proctor
- Survey Worker

Opening jobs in this group:

Critical barriers for the handicapped worker in these jobs are public attitudes, communication handicaps, lack of skill and, in some cases, lack of mobility. Considerable aptitude is required in handling data and people; thus, the retarded would be excluded in most cases. Mobility handicaps are probably the most easily managed. These jobs would be difficult for the nonvocal except if information could be efficiently communicated by some other means. These jobs would also be difficult for persons with severe cosmetic handicaps.

.168, .268

INVESTIGATING, PROTECTING, AND RELATED WORK

Work activities primarily involve conducting investigations and examinations designed to determine or ensure compliance with statutes, ordinances, and similar regulations affecting the public interest and welfare; and otherwise enforcing laws or regulations designed to protect the citizenry from harm to themselves or their property. Requires the capacity to acquire knowledge of laws and regulations and to learn investigative procedures and methods; verbal ability to converse with people at varied levels; tact and diplomacy; ability to perform under stress and maintain equanimity in the face of danger or resistance; organizational ability; an assurance of manner; and physical stamina. (DOT, Vol. 2, p. 416)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTILPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Detective					C*						

*Trainee in Competitive Employment

Other jobs in this group:

- Discipline Counselor (education)
- Umpire
- Building Inspector
- Coroner
- Insurance Examiner
- Park Ranger
- Censor
- Claim Adjuster
- Fire Inspector
- Head Matron
- Driver's License Examiner

Opening jobs in this group:

Most of these jobs appear to require mobility, communication, public acceptance, above-average intellectual ability, and at least a high school education. In order to accomplish much of the investigative work, handicapped persons with mobility problems would require adequate mobility devices and, probably, the help of nonhandicapped workers. Because of the extensive communication required, communication barriers may be very difficult to surmount even with communication devices.

.181, .281

DRAFTING AND
RELATED WORK

Work activities involve the translation of ideas, rough sketches, specifications, and calculations of engineers, architects, and designers into complete and accurate working plans for use in building or manufacturing. Requires the ability and interest necessary to understand and apply technical knowledge and theoretical principles involved in drafting, engineering, mathematics, and related fields; ability to visualize spatial relationships, perceive slight differences in visual matter, and work with detail; and finger dexterity. (DOT, Vol. 2, p. 377)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Engineering Assistant								C			
Draftsman (unspecified)				C	C			C			
Draftsman, Architectural					C		C				
Draftsman, Mechanical							C				
Detailer, Auto			C								
Draftsman, Apprentice			C				C				

C = Competitive Employment

Other jobs in this group:

- Draftsman, Architectural
- Draftsman, Aeronautical
- Map Editor
- Draftsman, Landscape

82

Opening jobs in this group:

The variety of severely handicapped persons presently holding jobs in this worker trait group suggests that many handicaps can be successfully managed. An inability to apply technical knowledge and the demands of an extensive mainstreamed education will prohibit many handicapped workers from entering these jobs. A redesigned work place and special mobility equipment or tools may be helpful.

.181, .281

TECHNICAL WORK,
ENGINEERING, AND
RELATED FIELDS

Activities involve the application of engineering-related and technical knowledge in direct support of the engineer. Requires a combination of ability to learn and to apply basic engineering and technical principles and methods; facility with mathematics and language; and spatial perception. (DOT, Vol. 2, p. 379)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Electronic Technician									C	C	

C = Competitive Employment

Other jobs in this group:

- Mechanical-Engineering Technician
- Field Engineer, Specialist
- Accelerator Operator (nuclear engineering)
- Quality-Control Technician
- Sound Effects Man (radio and television broadcasting)

Opening jobs in this group:

Jobs in this group will be restricted to severely handicapped persons who have, or can attain, sufficient technical education and background. Technical ability is also required. Technical work performed in a laboratory will be better suited to persons with mobility problems. These jobs could be done by the non-vocal, assuming that communication devices would allow writing or communicating data in some other form.

.181, .281, .381

MATERIALS ANALYSIS AND RELATED WORK

Activities primarily involve applying principles of chemistry, physics, metallurgy, and related disciplines to the analysis, testing, and compounding of such materials as ores, foods, chemicals, and drugs. Requires the intellectual ability and interest to acquire the necessary academic background; attention to detail; mathematical facility; and form perception to recognize physical differences in materials. (DOT, Vol. 2, p. 418)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Histopathologist							C				
Biochemistry Technologist			C								
Laboratory Technician				C							
Medical Technician										C	
Medical Technologist			C				C				

C = Competitive Employment

Other jobs in this group:

- Laboratory Assistant, Metallurgical (iron and steel)
- Air Analyst
- Assayer
- Engineer, Soils
- Seed Analyst
- Public-Health Bacteriologist
- Pharmacist
- Biochemistry Technologist
- Dairy Tester

Opening jobs in this group:

These jobs uniformly require high intellectual ability and many require formal schooling to the B.S. degree level. Therefore, handicapped persons without these prerequisites will be excluded from many jobs in this group. Some jobs may require only on-the-job training. Jobs may be opened by redesigning the work place or by providing special communication or mobility equipment where required.

.187, .284, .287

APPRAISING AND INVESTIGATING WORK

Work activities involve applying a knowledge of the principles and techniques pertinent to such specific fields as mining, construction, merchandising, and sanitation in order to appraise the worth of or investigate the condition or state of objects, systems, activities, and procedures. Requires the intelligence and verbal facility to understand, learn, and apply concepts and procedures; numerical skill; spatial aptitude; and form perception. (DOT, Vol. 2, p. 420)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Appraiser, Real Estate										C	

C = Competitive Employment

Other jobs in this group:

- Appraiser, Art
- Furniture-and-Bedding Inspector
- Safety Inspector
- Building Inspector
- Building-Construction Inspector
- Appraiser, Automobile
- Diamond Expert

Opening jobs in this group:

Entry into these jobs is gained by a record of successful technical preparation and/or experience in lower positions. The capable handicapped worker will likely be required to enter in the same fashion; therefore, successful entry will depend upon gaining sufficient education and experience in the appropriate field.

.188, .288

ACCOUNTING, AUDITING, AND RELATED WORK

Activities primarily involve the application of the principles of accounting, cost analysis, and statistical analysis to problems of fiscal management, auditing, and the like. Requires the ability to concentrate for long periods; good vocabulary and verbal expression; organizational ability; speed and accuracy in making numerical determinations; memory for detail; and the ability to understand the principals of accounting, statistics, and fiscal management. (DOT, Vol. 2, p. 252)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED– Trainable	MENTALLY RETARDED– Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Accountant			C		C				C	C	
Underwriter								C			

C = Competitive Employment

Other jobs in this group:

- Valuation Engineer
- Purchase Price Analyst
- Underwriter
- Loan Officer
- Assessor
- Appraiser

Opening jobs in this group:

Jobs in this worker trait group require keen intellectual and numerical ability along with an appropriate, and relatively long-term, academic preparation. Handicapped workers not possessing these prerequisites will be effectively excluded. As these jobs do not require facility in working with things, they may be good prospects for handicapped workers who have mobility or manipulation problems. They are also good prospects for nonvocal handicapped workers who are able to write, or to operate printing devices. A specially designed work space may be useful.

.228

HIGH SCHOOL,
COLLEGE,
UNIVERSITY, AND
RELATED EDUCATION

Work activities primarily involve teaching academic or commercial subjects at any of the levels ranging from high school through college and graduate school. Requires interest in people and ability to communicate ideas; intellectual capacity sufficient to acquire necessary background in subject matter area and in teaching techniques; organizational ability to present facts in answering students' questions and to plan programs of instruction; and perception for clerical detail. (DOT, Vol. 2, p. 341)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Teacher, Unspecified								C			
Faculty Member, College or University								C			
Teacher, Secondary School							C	C			
Teacher, Substitute										C	

C = Competitive Employment

Other jobs in this group:

- Teacher, Blind
- Teacher, Deaf
- Teacher, Mentally Retarded
- Instructor, Correspondence School
- Park Naturalist
- Teacher, Adult Education

Opening jobs in this group:

These jobs require the handicapped worker to possess high intellectual capability, the ability to communicate both vocally and in writing, and at least a bachelor's degree in an appropriate subject area. Severe barriers to the handicapped worker are communication handicaps, public attitudes, and difficulty in obtaining an appropriate public education. Many job areas do not require facility with objects or demand high-level mobility.

.268

NEWS REPORTING AND RELATED WORK

Work activities primarily involve gathering information of a newsworthy nature and/or writing stories, articles, and similar materials relating to this information for publication in newspapers or periodicals or for broadcast over radio or television. Requires facility with language and good vocabulary; the ability to understand and relate to people; organizational ability; powers of persuasion; the ability to adjust to a variety of different situations; and attention to detail. (DOT, Vol. 2, p. 526)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Feature Reporter								C			
Reporter						C					

C = Competitive Employment

Other jobs in this group:

- Correspondent
- Rewrite Man

Opening jobs in this group:

Major barriers to handicapped workers in this group include restricted mobility (required to do necessary research), communication barriers (inability to write), and difficulties in obtaining sufficient education for skill development. Persons who have writing skills may be able to depend upon others to gather information. Writing devices could be utilized for those unable to write, and mobility devices could be utilized where possible.

.258, .358, .458

DEMONSTRATION AND SALES WORK

Activities primarily involve using persuasive techniques to sell and/or demonstrate products or services, drawing upon some knowledge relevant to items or services sold. Requires facility with words; ability to become familiar with the objects, materials, or services involved; numerical facility and perception for clerical detail; drive and initiative; diplomacy and tact in dealing with people; and powers of persuasion. (DOT, Vol. 2, p. 488)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Salesman, Medical Equipment and Supplies										C	
Salesperson (unspecified)	C									C	
Salesperson, Advertising								C			
Salesperson, Food			C								
Salesman, Farm Equipment and Supplies								C			
Salesman, Auto								C		C	
Salesman, Office Machines			C								
Salesman, Jewelry										C	
Salesman, House-to-House								C			
Salesman, Novelties											C
Salesperson, General Merchandise			C								
Salesperson, Parts				C							
Telephone Solicitor			C	C	C	C	C, S*	C	C	C	C
Salesperson, General			C		C						

C = Competitive Employment; S = Sheltered Workshop
*Also homebound

Other jobs in this group:

- Salesman, Investment and Tax Counseling Service
- Salesman, Trading Stamps
- Salesperson, Flowers
- Salesman, Advertising
- Salesman, Chemicals and Drugs
- Salesperson, China and Glassware
- Salesman, Dental Equipment and Supplies
- Salesman, Sewing Machine
- Salesman, Automobile

Opening jobs in this group:

The ability to communicate is a prerequisite for most of these jobs. Public attitudes and mobility are barriers which require careful management. Since these jobs require direct contact with people, and success depends largely upon public acceptance, careful consideration must be given to presenting a pleasing public image. Many of these jobs require considerable mobility; however, numerous persons, with a variety of handicapping conditions, presently hold jobs in this group, indicating that some of the jobs (e.g., telephone solicitor) appear to have many advantages for the handicapped.

.271, .371

BEAUTICIAN AND BARBERING SERVICES

Activities primarily involve providing customers with a variety of personal services related to their physical appearance. Requires the ability to understand, learn, and apply various techniques of cosmetology and barbering; a creative flair for originating or adapting styles to suit individual customers; the ability to relate to people at all levels; the ability to perceive slight differences in color and in forms; eye-hand coordination; and finger dexterity. (DOT, Vol. I, p. 499)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Cosmetologist				C		C					
Shampooer	C			C							
Barber				C			C				C

C = Competitive Employment

Other jobs in this group:

- Body-Make-Up Man
- Scalp Treatment Operator

Opening jobs in this group:

Major barriers for handicapped workers include the inability to use the arms and hands, negative public attitudes, and, to some extent, the inability to communicate. Orthopedically handicapped persons who are able to use their arms and hands may find special mobility devices useful. Special training may be required to augment skills or cosmetic appearance. Licensing requirements may be a barrier to those persons who lack formal training.

.268, .368

SECRETARIAL AND
RELATED WORK

Work activities primarily involve taking dictation, typing, and assuming minor executive duties that relieve organizational officials from these responsibilities. Requires facility with words; the ability to perform work of a detailed nature successfully and avoid errors; diplomacy and tack in dealing with people; an interest in meeting people and the ability to adapt to fluctuating situations; form perception to perceive differences in shorthand symbols; and motor coordination and finger dexterity for some office machines. (DOT, Vol. 2, p. 263)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Secretary			C				C				

C = Competitive Employment

Other jobs in this group:

- Legal Secretary
- Social Secretary
- Medical Secretary
- Script Clerk

Opening jobs in this group:

The professional demands upon a secretary vary widely. Therefore, it should be possible to find positions for various levels of qualified handicapped workers. Handicapped persons lacking motor dexterity of the arms and hands will probably be excluded from these jobs because of the necessity to run office machines, including typewriters. Special typewriters may be adapted to individual workers' needs. As the work is sedentary, mobility handicaps are not crucial. Severely mentally retarded persons will be excluded. Special training will be useful in augmenting skill development. Attitudes may be an initial barrier but can be offset by demonstrations of competency.

.280, .380

SET UP and/or
ALL-ROUND MACHINE
OPERATING

Work activities primarily involve applying a knowledge of machine capabilities, properties of materials, and shop practices to situations involving the setting up of machines for others to operate and/or the setting up and personal operation of a variety of machines. Requires a preference for working with machinery; attention to detail; visual acuity; the ability to comprehend and apply mechanical principles and technical data; facility in basic mathematics; eye-hand coordination; manual and finger dexterity; physical stamina and agility; and the ability to adapt to fluctuating situations. (DOT, Vol. 2, p. 430)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED– Trainable	MENTALLY RETARDED– Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Machinist, Apprentice			C								
Cabinet Maker			C	C							
Machine Set-up Operator				C							
Turret-Lathe Operator				C							
Machine Operator I									C		

C = Competitive Employment

Other jobs in this group:

● Tool-and-Die Maker ● Grinder Operator ● Engine-Lathe Set-Up Operator ● Chucking-Machine Set-Up Operator ● Milling-Machine Set-Up Man ● Boring-Machine Set-Up Operator ● Drill-Press Set-Up Operator ● Machine Operator ● Press Operator ● Plate Finisher (printing) ● Millman (woodworking) ● Precision-Lens-Grinder ● Packaging-Machine Adjuster

Opening jobs in this group:

Entry to these jobs is usually gained by apprenticeship programs or on-the-job training. Handicapped workers unable to undergo such training or to manipulate objects would be excluded from these jobs. Those with mobility handicaps may be aided by mobility devices or by redesigning the work place. Public attitudes may interfere with obtaining a job or may contribute to false expectations of worker performance.

.281, .381

COOKING AND
RELATED WORK

Work activities involve planning and preparing meals in private homes or in restaurants, hotels, camps, and other places serving large numbers of people. Requires the ability to learn the theory and techniques of food preparation; ability to plan menus and to compute quantities and costs to order supplies; form perception to examine food and to prepare food arrangements or displays; finger and manual dexterity; willingness to wear a uniform; and good health to pass a strict physical examination and obtain a health card from the health department. (DOT, Vol. 2, p. 310)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Cook, Domestic Service									C		
Cook (unspecified)			C							C	
Cook (food service worker)			C	C							
Cook, Restaurant										C	
Short-Order Cook	S,C		C	C	C						

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Baker, Pizza
- Cook, Mess (water transport)
- Cook, Railroad
- Cook, Ranch

Opening jobs in this group:

Jobs in large hotels and restaurants usually require that the worker be a graduate of a cooking school or institute. However, most of the jobs in this group are entered by working in a kitchen under the direction of a full-time cook. A handicapped worker will require training acceptable to the employer. Mobility and communication devices may be useful; work places may be modified and jobs redesigned so that tasks beyond the capability of the handicapped worker can be performed by others. Public attitudes are not likely to be a barrier in this worker trait group because the jobs do not require direct public contact. The variety of handicapped workers currently performing successfully in these jobs suggests that these jobs may be good prospects for other handicapped workers.

.281, .381

CRAFTSMANSHIP AND RELATED WORK

Work activities primarily involve fabricating, processing, inspecting, or repairing materials, products, or structural units. Requires the ability to learn and apply craft techniques, processes, and principles; ability to use independent judgment in planning sequence of operations and in selecting proper tools and materials; ability to assume responsibility; ability to apply shop mathematics to practical problems; spatial perception; form perception; and some combination of eye-hand coordination and finger and manual dexterity. (DOT, Vol. 2, p. 312)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED-Trainable	MENTALLY RETARDED-Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Mechanic, Unspecified	C			C							
Repairman, Unspecified							C				
Inspector										C	
Engine Service Repairman	C		C	C	C		C				
Pump Serviceman Repairman							C				
Repairman Assistant	C									C	
Locksmith										C	
Watchmaker							C				
T.V. Repairman			C	C	C	C	C				
Electromechanical Assembler			C								
Electronics Assembler	C				C	C,S	C				
Fitter (machine shop)									C		
Electrician			C								
Dental Equipment, Installer and Serviceman								C			
Carpet Layer										C	
Lady Attendant (funeral home beautician)				C							
Shoe Repairman				C		C					
Dental Laboratory Technician Apprentice									C		
Dental Technician (crown and bridge)			C				C			C	
Optical Mechanic									C		
Small Appliance Repairman			C								
Printed Circuit Technician			C				C				
Assembler	C							C		C	
Furniture Finisher	C			C			S				
Engraver							C				
Furniture Upholsterer				C		C					
Seamstress, Drapery			C								
Shop Tailor				C							
Telephone Inspector								C			
Carpenter			C								

C = Competitive Employment; S = Sheltered Workshop

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Bricklayer			C								
Maintenance Man, Building			C							C	C
Artist, Commercial										C	
Layout Man II			C								
Letterer				C							
Copy Cameraman				C						C	

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

• Carpet Layer • Embalmer • Lighthouse Keeper • Butcher • Automobile Mechanic • Motorcycle Repairman • Aircraft-and-Engine Mechanic • Jeweler • Hand Engraver • Sewing Machine Assembler • Locksmith • Model Maker (jewelry) • Instrument Repairman • Dental Ceramist • Diamond Cutter • Glass Blower • Electrician, Radio • Painter, Sign • Photoengraver • Silk-Screen Maker

Opening jobs in this group:

This worker trait group consists of jobs that involve a variety of skills. Entry into these jobs is usually through apprenticeships which provide 2 to 6 years of on-the-job training and trade instruction. Opportunities for opening jobs to handicapped workers include adapting the work place, redesigning jobs to suit the capabilities of handicapped workers, and utilizing special tools, mobility aids, and communication devices. Negative public attitudes may be overcome by involving business, labor, and industry in training and placement. Once handicapped workers prove their productivity, attitude barriers should fall. Special needs programs in vocational training schools will become more and more useful.

.282, .382

RADIO AND
TELEVISION
TRANSMITTING AND
RECEIVING

Work activities involve setting up and operating radio and television transmitting, receiving, and studio-control equipment in fixed and mobile stations, and setting up and operating electronic control equipment to mix and control sound for transmission over closed circuit systems or to record programs on disc, tape, or film. Requires the capacity to understand the principles of radio and television communication systems and to comprehend operating instructions related to federal communications regulations; ability to learn technology and codes of radio broadcasting; ability to work skillfully with one's hands; ability to adjust to various kinds of operating situations; and the ability to pay attention to detail. (DOT, Vol. 2, p. 516)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Dispatcher										C	
Transmitter Operator										C	

C = Competitive Employment

Other jobs in this group:

- Airline Radio Operator
- Radiotelegraph Operator
- Sound Man (amusement and recreation)
- Audio Operator (radio and television broadcasting)
- Control-Room Man (radio and television broadcasting)

Opening jobs in this group:

The majority of workers who enter this field have received specialized training in electronics or equivalent work. Some gain experience by working in less complex jobs at radio or television studios. Workers who operate or adjust transmitters must hold an appropriate Federal Communications Commission license. As these jobs require light lifting and the manipulation of objects, handicapped workers without the use of arms and hands would be severely limited. Speaking is not necessarily required, and these jobs may be open to the nonvocal who have sufficient technical background.

.288

TECHNICAL WRITING AND RELATED WORK

Work activities involve preparing written descriptions of technical operations and developments, kinds and uses of industrial property, and structural and functional relationships of machines and equipment. Requires the ability to grasp technical subject matter and terminology; lucid verbal expression; ability to visualize spatial relationships of objects on flat surfaces; and analytical ability and logic in organizing material. (DOT, Vol. 2, p. 387)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Legislative Analyst						C					

C = Competitive Employment

Other jobs in this group:

- Specification Writer, Airplanes
- Specification Writer, Engineering
- Writer, Technical Publications
- Engineering Clerk

Opening jobs in this group:

A person seeking entry into this field is ordinarily required to possess a bachelor's degree with special emphasis in technical writing, journalism, or English. Work in this field is sedentary and does not require the manipulation of objects; mobility handicaps can often be managed for handicapped workers who possess sufficient intellectual abilities. A vocal handicap could be managed with appropriate communication devices. Of course, the ability to write, either by hand or with the use of special aids (e.g., a mouthstick, an electric typewriter), is a critical requirement. Attitude barriers should be relatively easy to manage once technical competency has been demonstrated.

.288

TRANSLATING, EDITING, AND RELATED WORK

Activities primarily involve translating the written word from one language to another; analyzing coding systems to decode messages; determining the suitability of material for publication; editing material for format, style, grammar, content, and composition; and conducting research in museums, libraries, and archives. Requires good vocabulary and facility with language; ability to communicate ideas and proper syntax of language being translated; accuracy and precision in editing materials; and analytical ability to conduct research, abstract pertinent material, and prepare clear, concise reports. (DOT, Vol. 2, p. 528)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Research Assistant II			C					C			

C = Competitive Employment

Other jobs in this group:

- Bibliographer
- Book Critic
- Editing Clerk
- Foreign-Exchange Code Clerk (banking)
- Translator
- Handwriting Expert
- Editor, Film (motion picture)

Opening jobs in this group:

In most cases workers are required to complete a college education with concentration in appropriate foreign languages, English, and writing courses. Persons who are nonvocal or are unable to write because of orthopedic handicaps may be excluded from these jobs unless sufficient skill augmentation can be achieved with communication devices. The work is largely sedentary and mobility barriers can probably be managed with various mobility devices. Public attitudes should not be a major problem as many of these jobs do not require direct contact with people. However, attitudes may be the greatest barrier in obtaining sufficient training and initial placement.

.368

FACILITIES, SERVICES, AND MOVEMENT ALLOCATING AND EXPEDITING WORK

Activities involve allocating and ensuring the expeditious or proper utilization of personnel, equipment, supplies, services, or facilities for specific purposes according to predetermined schedules, priorities, and procedures. Requires the ability to become thoroughly familiar with established rules and guidelines governing work situations; ability to communicate orally; clerical perception to avoid errors in reading tabular information and in keeping accurate records; ability to adjust to fluctuating circumstances; ability to relate to people; and reliability. (DOT, Vol. 2, p. 265)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Hotel Clerk			C						C		
Reservations Clerk			C							C	
Recreation Facility Attendant							C				

C = Competitive Employment

Other jobs in this group:

- Expeditor (clerical)
- Manager, Floor (wholesale trade)
- Dispatcher, Maintenance (clerical)
- Reconsignment Clerk (railroad transportation)
- Customer-Service Specialists
- Dispatcher, Radio
- Dispatcher, Car Rental

Opening jobs in this group:

Handicapped persons with general clerical training or experience may gain entry into trainee positions. Employers commonly fill jobs in this group by promoting employees from within the organization. Mobility handicaps will be a barrier in those jobs which require light lifting. The nonvocal will be excluded from many of these jobs.

.368

INFORMATION
GATHERING,
DISPENSING,
VERIFYING, AND
RELATED WORK

Activities involve allocating and ensuring the expeditious or proper utilization of personnel, equipment, supplies, services, or facilities for specific purposes according to predetermined schedules, priorities, and procedures. Requires the ability to become thoroughly familiar with established rules and guidelines governing work situations; ability to communicate orally; clerical perception to avoid errors in reading tabular information and in keeping accurate records; ability to adjust to fluctuating circumstances; ability to relate to people; and reliability. (DOT, Vol. 2, p. 265)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Hospital Admitting Clerk										C	
Information Clerk										C	
Receptionist			C	C		C	C	C		C	
Counter Clerk			C								
Library Page			C		C					C	
Order Clerk II		C				C		C			

C = Competitive Employment

Other jobs in this group:

- Registration Clerk (library)
- Prompter (amusement and recreation)
- Social Security Clerk
- Insurance Clerk (medical service)
- Telegraph Messenger
- Manager, Traffic
- Lost-and-Found Clerk
- Court Clerk (government service)
- Loan Officer (banking, financial institution)

Opening jobs in this group:

Entry to these jobs is often by means of advancement from clerical positions. Desirable personal characteristics include speaking ability, tact, and a pleasing appearance. Mobility handicaps may be significant barriers for jobs which require moving from place to place. A communication handicap may also constitute a significant barrier. However, the variety of handicapped workers presently doing these jobs suggests that many such jobs will be available for the severely handicapped.

.368

PAYING AND RECEIVING
(banks and other
establishments)

Work activities primarily involve receiving funds from people in such establishments as banks, credit unions, and loan agencies and recording the monetary transactions incidental to the conduct of business. Requires the ability to learn and to apply bookkeeping procedures; accuracy, rapidity, and attention to detail when exchanging money and recording transactions; manual and finger dexterity to operate calculating machines; tact, courtesy, honesty, a neat appearance, a good memory, and affability. (DOT, Vol. 2, p. 267)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED–Trainable	MENTALLY RETARDED–Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Cashier I			C			C	C				

C = Competitive Employment

Other jobs in this group:

● Teller (banking) ● Post-Office Clerk

Opening jobs in this group:

A high school education is adequate preparation for satisfying the requirements of most employers. Individuals with experience in bookkeeping or commercial courses who can operate calculating machines are often preferred. For the handicapped worker, special short-term training may develop useful skills. These jobs are sedentary, and capable orthopedically handicapped persons who are able to use their arms and hands will be eligible for them. Persons who have severe communication handicaps will probably be excluded. Many of these jobs require working with the public, and attitudes may be a barrier for those who are cosmetically handicapped.

.368, .378

NURSING, X-RAY, AND RELATED SERVICES

Work activities involve caring for the sick and injured and providing nursing services; utilizing x-ray and other medical laboratory equipment for diagnostic and therapeutic purposes; and helping persons with muscle, nerve, joint, or bone injuries or diseases to overcome such disabilities. Requires the desire and ability to learn, absorb, and apply technical training; a facility for relating with people; exactness and precision for preparing or administering treatment or medication and keeping charts; ability to perceive differences in anatomical components; finger dexterity and eye-hand coordination; cleanliness, good health, and freedom from communicable diseases. (DOT, Vol. 2, p. 477)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Medical Assistant			C								
Occupational Therapy Aide			C	C				C		C	
Physical Therapist										C	

C = Competitive Employment

Other jobs in this group:

- Nurse, General Duty
- Nurse, Private Duty
- Audiometrist
- Dental Hygienist
- Electrocardiogram Technician
- Dental Assistant

Opening jobs in this group:

All of these jobs require basic preparation for practice. Some programs last 3 years, other lead to a bachelor's degree and require 4 or 5 years of college study. Some junior college programs last 2 years. Handicapped workers may be able to perform in these jobs if job simplification or redesign of work tasks can accommodate individual handicapping conditions. Many handicapped workers are doing portions of these jobs which they learn on the job or through special training. Specially designed work stations may be useful for some of the special service occupations.

.382, .384, .387,
.484, .487

INSPECTING AND
STOCK CHECKING

Activities primarily involve examining stores of materials and supplies and compiling inventory records; inspecting products and structures to verify adherence to material and assembly standards of the type recorded on blueprints; and testing products and equipment to verify adherence to functional specifications of the type found in operating and maintenance manuals. Requires numerical skill and clerical aptitude to prepare inventory or inspection data and to keep accurate and legible records; some combination of form, spatial, and color perception; finger and manual dexterity and eye-hand coordination; precision and accuracy in working close to detail. (DOT, Vol. 2, p. 271)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED– Trainable	MENTALLY RETARDED– Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Inspector, Printed Circuit Board										C	
Shipping and Receiving Clerk				C	C						C
Material Clerk								C			
Stock Clerk	C		C	C	C		C			C	
Storekeeper										C	
Tool Clerk									C		
Inspector (ammunition)									C		
Inspector, Grinding Wheel								C			

C = Competitive Employment

Other jobs in this group:

- Pharmacy Helper
- Linen-Room Attendant
- Grader, Meat (slaughter and meat packing)
- Quality-Control Technician (food preparation)
- Pulp-and-Paper Tester
- Tester, Motor (automobile manufacturing)
- Sewing Machine Tester
- Contact-Lens Inspector
- Fur Sorter (fur goods)

Opening jobs in this group:

Some education or vocational training in subjects such as mechanical drawing, blueprint reading, and shop mechanics is generally required for these jobs. Entry usually requires familiarity with specific materials, products, or standards acquired through experience in lower level positions. Work may be sedentary, light, or medium. A variety of jobs apparently are open for handicapped workers who have adequate numerical and clerical aptitude. Mobility handicaps are being managed for a variety of positions. Communication barriers are not usually critical and should be helped by various communication devices.

.382, .582

TYPESETTING, REPRODUCING, AND RELATED MACHINE WORK

Activities primarily involve setting up, adjusting, and operating data-processing, typesetting, linotype, duplicating, addressing, and similar commercial machines. Requires the ability and willingness to follow instructions in performing work of a routine, organized nature; attention to detail and good reading comprehension; form and spatial perception, eye-hand coordination, and finger and manual dexterity for using machines; and an inclination toward working with machines. (DOT, Vol. 2, p. 274)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Digital Computer Operator						C					
Computer Operator			C								
Keypunch Operator			C	C		C	C			C	C
Addressing Machine Operator			C								

C = Competitive Employment

Other jobs in this group:

- Vari-Typist
- Braille-Duplicating-Machine Operator
- Computer-Peripheral-Equipment Operator
- Addressing-Machine Operator
- Wire-Photo Operator
- Linotype Operator

Opening jobs in this group:

A variety of handicapped workers are presently employed in jobs in this group. Long and complicated training is not required, although many employers prefer that a worker have a high school education. Handicapped workers must be able to use their arms and hands in order to manipulate machinery. Communication problems of a vocal nature can probably be circumvented with communication devices. Negative public attitudes may best be managed by demonstrated competency. On-the-job training would be a useful placement strategy.

.384

TECHNICAL WORK,
SCIENCE AND
RELATED FIELDS

Work activities involve applying basic scientific knowledge to the performance of a variety of supporting tasks in a laboratory or similar scientific environment. Requires the ability to absorb technical information and to follow established procedures; verbal facility to learn and use technical terminology; ability to perceive minute differences in forms and compositional characteristics; manual dexterity to handle small or fragile objects; and ability to pay attention to detail in work of a clearly prescribed and organized nature. (DOT, Vol. 2, p. 413)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Scientific Helper								C			

C = Competitive Employment

Other jobs in this group:

- Chemist Helper, Petroleum
- Biological Aid (agriculture)
- Agricultural Aid (agriculture)
- Artificial Breeding Technician (agriculture)
- Blood Tester, Fowls

Opening jobs in this group:

Workers generally need a 6-month to 1-year training period to become familiar with the terminology and procedures involved in the various scientific areas in this worker trait group. Employers usually require a high school education or its equivalent as preparation. Job training may best be done on the job. Many of the jobs require light to moderate lifting. Handicapping conditions that are major barriers include lack of skill development and lack of mobility. Mobility handicaps may be managed by redesigning the work place, providing special tools, or redesigning job tasks. Communication handicaps may be managed with special devices.

.383

CLASSIFYING,
FILING AND
RELATED WORK

Activities involve gathering together, classifying, sorting, and/or filing correspondence, account records, business forms, and related data. Preparing reports and keeping records are frequently involved. Requires reading comprehension; numerical facility; accuracy and attention to detail; and the ability to follow directions and established procedures. (DOT, Vol. 2, p. 276)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
File Clerk			C			C			C	C	C
Computer Programmer										C	
Estimator							C				
Insurance Clerk							C				
Inventory Clerk								C		C	
Merchandise Distributor				C							
Mail Carrier						C					
Dispatcher, Maintenance Service				C						C	

C = Competitive Employment

Other jobs in this group:

- Cataloger (library)
- Escrow Officer
- City Planning Aid
- Parcel-Post Clerk
- Compiler

Opening jobs in this group:

These jobs appear to be promising for severely handicapped persons who have the ability to obtain pertinent information by reading (or some other method), to do required arithmetical computations, etc. A mobility handicap would be a barrier in some jobs but not in others. Communication handicaps are not critical for most jobs and could be managed by communication devices. On-the-job training would be required and, in many cases, employers may require a high school diploma or its equivalent, with successful completion of commercial courses and demonstrated familiarity with elementary clerical skills.

.388

CORRESPONDING AND RELATED WORK

Activities involve preparing correspondence, reports, forms, and other documents, and examining, editing, and recording verbal information or written material. Requires facility with language and a good vocabulary; attention to detail; application of precise standards, techniques, and mechanics of good grammar, spelling, and punctuation; and ability to organize data in logical sequence when composing correspondence and other material. (DOT, Vol. 2, p. 256)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Sales Correspondent								C			
Collection Clerk											C

C = Competitive Employment

Other jobs in this group:

- Customs Clerk
- Loan Clerk

Opening jobs in this group:

Handicapped persons seeking entry into these jobs must have adequate language and writing skills. Most employers require the equivalent of a high school education and several semesters of college work with emphasis on English grammar and composition. Workers will be required to write or type. Vocal communication is not critical; neither is mobility as most of the work is sedentary. These jobs appear to have promise for the homebound.

.388

STENOGRAPHIC AND RELATED WORK

Activities involve taking shorthand by hand or machine and transcribing it with a typewriter. Requires the ability to understand the meaning and relationships of words and sentences; finger dexterity and eye-hand coordination; form perception to recognize shorthand symbols; adaptability to routine, repetitive and uninvolved tasks; attention to detail; willingness to work according to instructions; ability to work with specialized terminology, such as that in the medical, legal, or engineering fields. (DOT, Vol. 2, p. 278)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Stenographer			C								

C = Competitive Employment

Other jobs in this group:

- Court Reporter
- Stenotype Operator

Opening jobs in this group:

A number of handicapping conditions make it difficult for the handicapped to perform these jobs. Except in the most supportive situations, adequate skill development, coordinated use of the arms, hands, and fingers, good communication abilitiy, and a pleasing cosmetic appearance are critical, especially in competitive situations. Most stenographic workers are high school graduates who have received specialized training in typing, shorthand, and business methods. Special training will be necessary to develop skills. Negative attitudes of employers and other employees may best be managed by demonstrated competency.

.388, .488

COMPUTING AND
RELATED RECORDING

Activities involve performing arithmetic computations and preparing numerical records with the aid of typewriters and adding, billing, bookkeeping, and calculating machines. Requires the intellectual capacity and interest to acquire an understanding of systematic, numerical, recordkeeping and data-gathering procedures; ability to apply arithmetic principles and to correct computation errors; attention to detail to avoid clerical errors; form perception; eye-hand coordination; and finger and manual dexterity. (DOT, Vol. 2, p. 280)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Bookkeeper				C	C		C	C			
Bookkeeper Helper						C					
Bookkeeping, Machine Operator									C		
Clerk, General Office							C		C	C	
Billing Clerk (I, II)				C							
Chart Processor			C								
Calculating Machine Operator			C								
Accounting Clerk						C	C		C		
Estimator								C			

C = Competitive Employment

Other jobs in this group:

- Adding-Machine Operator
- Manifest Clerk
- Weight-Count Operator
- Insurance Clerk (banking)
- Policy Change Clerk (insurance)
- Statistical Clerk
- Timekeeper

1 ; 1

Opening jobs in this group:

There should be many jobs in this group open to handicapped workers who have arithmetical and clerical ability and a general knowledge of the work and the equipment involved. Special training may augment skill development. Persons without the use of arms and hands will be prohibited from these jobs unless the jobs have been redesigned or special equipment has been adapted to their requirements. Communication barriers may be circumvented with communication devices. The handicapped worker's demonstrated competency should be effective in overcoming attitude barriers.

.468

CASHIERING
(drug stores,
theaters,
restaurants,
and related
establishments)

Work activities primarily involve paying and receiving money or its equivalent and keeping records of receipts and expenditures. Requires the ability to work with figures and to learn simple bookkeeping procedures; finger dexterity; tact and courtesy; speed and accuracy in making computations; good eye-hand coordination; neat appearance; pleasant disposition; and, in most cases, ability to operate a cash register or an adding, calculating, or similar machine. (DOT, Vol. 2, p. 269)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Cashier II			C	C	C	C	C,S			C	

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Cashier, Courtesy Booth
- Cashier, Currency Exchange
- Station Agent
- Sales-Check Writer
- Cashier-Checker
- Gambling Dealer

Opening jobs in this group:

Job entry in this group usually requires a high school diploma or some special training conducted by the business itself. Handicapped workers without the use of arms, hands, and fingers should avoid these jobs because of the need to handle money and to use business machines. Communication barriers may also be critical in some jobs. Mobility is not an important deterrent. As long as the handicapped worker has a pleasing appearance, public attitudes should not be critical.

.468, .478

CUSTOMER SERVICE WORK, N.E.C.

Work activities involve providing the public with a ready response for services or information requested. This includes such activities as recording or receiving payments for merchandise and selling miscellaneous specialties and general articles. Requires willingness to work in a service capacity; ability to understand and comply with requests of customers; ability to make simple arithmetic calculations; clerical accuracy; and a courteous manner and patience when dealing with the public. (DOT, Vol. 2, p. 501)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY-RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Salesclerk			C	C					C	C	

C = Competitive Employment

Other jobs in this group:

- Retail-Receiving Clerk
- Lay-Away Clerk
- Tool-Rental Clerk
- Groceryman, Journeyman
- Lunch-Truck Driver
- Delivery Boy
- Receiving-Room Clerk
- Repair Estimator
- Car-Rental Clerk

Opening jobs in this group:

Employers usually prefer high school graduates; however, actual work tasks are mostly learned by short, on-the-job demonstrations. Jobs may be open to handicapped workers who have the required numerical and clerical abilities. Mobility barriers should not be critical if transportation problems can be circumvented. In some cases, the work place may require adaptation to meet the needs of the individual. Communication barriers may be more difficult to manage because most of the jobs require working with the public. If direct public contact is required, personal appearance will be an important factor.

.484, .485, .487,
.584, .585, .587,
.683, .684, .685,
.637

SORTING, INSPECTING, MEASURING, AND RELATED WORK

Work activities primarily involve examining, measuring, or weighing objects or materials for the purpose of grading, sorting, detecting flaws or irregularities, or verifying adherence to specifications. Requires the ability and willingness to follow instructions to the letter; spatial and form perception to perceive differences in tangible matter; accuracy and attention to detail; finger and manual dexterity; eye-hand coordination; and disposition toward work of a routine, repetitive, and noncreative nature. (DOT, Vol. 2, p. 282)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED– Trainable	MENTALLY RETARDED– Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Shipping Checker	C										
Shipping Clerk II			C								
Laboratory Helper			C				C		C	C	
Mailer	C										
Control Inspector							C				
Inspector, General							C		C		
Salvageman	C					S					
Plasma Drawing Officer			C								
Collator	S	C,S	C,S	S							
Assembler (garment)			C,S	C,S			S				
Photo Checker and Assembler				C						C	

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Page (library)
- Currency Sorter (banking)
- Mail Sorter (railroad transportation)
- Weigher
- Mailer (printing and publishing)
- Stocking Inspector
- Glass Checker (optical goods)
- Diamond Sizer and Sorter
- Button Grader

1.8

Opening jobs in this group:

Workers generally learn the fundamentals of their jobs during a brief period of on-the-job training. Depending on the skill required and the learning rate of the worker, training may range from a few hours to several months. These jobs will be open to persons with a variety of handicaps. Severe barriers include the inability to use the arms and hands for sorting tasks, and a sense deprivation causing an inability to detect irregularities in the objects or materials being sorted. Intensive training, using operant conditioning techniques, has proven useful in training the retarded for some of these jobs.

.588

TYPING AND
RELATED RECORDING

Activities primarily involve recording or transmitting verbal or coded material by the use of such office machines as typewriter, tape perforator, Braille machine, and telegraphic key. Requires attentiveness to detail to avoid errors in transferring data from records or draft copies; motor coordination and finger dexterity; adaptability for repetitious work; form perception; and willingness to work under direction of others. (DOT, Vol. 2, p. 287)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Typist			C	C	C		C			C	
Telegraph Operator				C							
Transcribing Machine Operator				C							
Medical Transcriptionist										C	
Data Typist							C				

C = Competitive Employment

Other jobs in this group:

- Music Copyist
- Braille-Machine Operator
- Addresser (clerical)
- Morse Operator

Opening jobs in this group:

Most workers who enter these jobs are high school graduates who have received special training in typing and business methods. A satisfactory score on a typing test is usually required. Where proficiency in the operation of specific machines is required, training is usually done on the job. Many of these jobs should be open to handicapped workers who are trained, and who possess adequate mental and psychomotor abilities. Strategies for overcoming mobility, communication, and attitude barriers are relevant.

.858

SELLING AND
RELATED WORK

Work activities primarily involve soliciting people to participate in games and entertainments and to purchase such commodities as cigarettes, beverages, photographs, and newspapers. Requires powers of persuasion; verbal facility in dealing with people; an uninhibited nature; and quick thinking and agility in adapting to varied situations and responses. (DOT, Vol. 2, p. 493)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Vending Stand Operator				C							
Vender							C				

C = Competitive Employment

Other jobs in this group:

- Camera Girl (amusement and recreation)
- Newsboy
- Barber
- Booster

Opening jobs in this group:

Experience in selling or in public contact work is usually the entry requirement for these jobs. It may be desirable to modify the work station to suit individual handicapping conditions. Communication handicaps are a severe barrier, and persons with such handicaps should probably avoid these jobs.

.588, .688

ROUTINE CHECKING AND RECORDING

Work activities involve checking, entering, and posting verbal and numerical data on stocklists, ledgers, registers, and similar recordforms, and performing related routine clerical duties. Requires common sense to learn and follow routine clerical procedures; verbal ability and clerical aptitude to keep accurate and legible records and to perform such tasks as sorting bills, receipts, and invoices; temperament to perform repetitive work requiring constant and close attention to clerical details; and numerical ability to perform simple arithmetic when required. (DOT, Vol. 2, p. 289)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Clerk, General	C,S		C	C	C	C	C	C	C		
Clerk, Purchasing										C	
Clerk-Typist			C	C			C				
Delivery Clerk										C	
Mail Clerk	S		C,S	C	C	C	C			C	
Proofreader							C			C	
Sorter	C	S									

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Parking Enforcement Officer
- Meter Reader
- Posting Clerk
- Weight Taker (agriculture)
- File-Room Custodian

Opening jobs in this group:

Handicapped workers with a variety of handicapping conditions presently hold jobs in this worker trait group. Generally, entry requires a high school education with bookkeeping and typing courses, and up to 3 months on-the-job experience. A number of barriers have apparently been successfully managed. Special training may be useful in augmenting skills. Communication and mobility devices may be helpful.

.781

PRECISION WORKING

Activities primarily involve working with the hands, hand tools, or work aids according to prescribed standards. Responsibility for achievement of the ultimate goal rests with the individual worker, and considerable judgment must be exercised in adjusting the established techniques to the task at hand. Requires interest in working with the hands; manual and finger dexterity; eye-hand coordination; the ability to perceive small differences in things and objects and spatial relationships; and the ability to work to prescribed tolerances and rigid standards. (DOT, Vol. 2, p. 319)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Lapper									C		
Electronics Assembler			S				C	C	C	C	
Wig Maker					C						
Painter				C							
Painter Apprentice, Auto							C				
Carpenter, Rough			C	C							
Engraver I				C							

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Baker
- Glass Blower
- Lens Grinder
- Coil Winder (electrical equipment)
- Mouthpiece Maker (musical instruments)
- Weaver, Hand
- Internal-Combustion-Engine Assembler
- Bookbinder, Hand
- Engraver (printing and publishing)

Opening jobs in this group:

Intensive on-the-job training in required techniques and methods is the most common means of entering this field. Apprenticeship programs and work experience in jobs of lesser complexity are also common methods of entry. Depending upon the specific job, mobility handicaps may or may not be severe barriers; the physical requirements vary from sedentary work to heavy lifting. Communication handicaps may be aided by appropriate devices. An important objective for handicapped workers with the necessary skill potential will be obtaining on-the-job training.

.782

OPERATING--
CONTROLLING

Work activities primarily involve setting up, starting, adjusting, watching, and stopping machines and equipment to fabricate or process materials and products. Requires the ability to understand the functional nature of machines and to visualize the relationship of parts; the ability to perceive differences in shapes, textures, and surfaces; manual and finger dexterity; the ability to coordinate movement of eyes, hands and feet; and the intelligence to understand and follow written and oral instructions. (DOT, Vol. 2, p. 435)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Duplicating-Machine Operator II and III	C	C			C	C					
Offset-Duplicating-Machine Operator			C			C					
Presser, Machine	C		C	C							
Buffing-Machine Operator			C								
Pantograph Operator						C	C				
Drill-Press Operator, Production						C					
Bending-Machine Operator I										C	
Offset Pressman							C				
Offset Printer			C								
Sewing Machine Operator	C,S	S	C,S	S			C,S				
Stationary Engineer			C								
Blueprinting Machine Operator						C					
Pantographer							C				

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

• Leather Finisher • Casting Machine Operator • Miller, Wet Process • Carbon Furnace Operator • Pulp Machine Operator • Injection Molding Machine Operator • Glue Maker • Bottle Machine Operator • Felting Machine Operator • Jigsaw Operator • Weaver • Welder • Pile Driver Operator • Oil Pumper • Incinerator Operator

Opening jobs in this group:

The most common method of gaining entry to these jobs is by supervised on-the-job training, supplemented with technical instruction; therefore, handicapped workers will most likely be required to enter apprenticeship programs in order to obtain these jobs and to break down attitudes of nonhandicapped workers which may otherwise prevent employment. Mobility handicaps will be more or less of a barrier, depending on the type of work. In some cases, communication barriers may be managed by communication devices. It may be useful to tailor machine controls to the needs of individual handicapped workers.

.862

SWITCHBOARD SERVICE

Work activities primarily involve operating telephone switchboards to relay incoming and internal calls to phones in an establishment and to make connections with external lines for outgoing calls. Taking messages, supplying information to callers, and recording number of calls made and charges are frequently involved. Requires tact and courtesy; motor coordination; finger and manual dexterity; ability to adjust to routine work; an affinity for dealing with people; verbal ability; good hearing; and a pleasant speaking voice. (DOT, Vol. 2, p. 29)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Central Office Operator							C				
PBX Operator			C								
Switchboard Operator (unspecified)							C	C		C	
Telephone Answering Service Operator										C	
Telephone Operator	S		C	C		C	C,S	C		C	

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Information Operator
- Switchboard Operator, Police District

Opening jobs in this group:

Handicapped workers who enter jobs in this worker trait group will be required to communicate effectively and pleasantly, and to have sufficient motor coordination and finger dexterity to operate switchboard equipment. Skill is gained largely by on-the-job training or short training sessions. Switchboard equipment varies in its demand for gross motor movements, and it may be possible to adapt equipment to the individual worker's motor abilities. For blind operators, special switchboards are available that use sound in place of light to indicate operations. An electronic larynx is available which substitutes electronic vibrations for the natural vibrations of the voice.

.863, .864, .865,
.867, .873, .874,
.877

**MISCELLANEOUS
CUSTOMER SERVICE
WORK**

Work activities involve providing customers with requested services or products through the use of body members, hand tools, or equipment. Requires courtesy and tact in dealing with people; manual and finger dexterity and eye-hand coordination; and physical stamina. (DOT, Vol. 2, p. 503)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Service Station Attendant	C			C							

C = Competitive Employment

Other jobs in this group:

- Photo-Machine Operator, Miniature
- Salesperson, Food
- Caterer Helper
- Ski-Tow Operator
- Ride Operator
- Chauffeur
- Launderette Attendant

Opening jobs in this group:

There are usually no established patterns for training and entry into this work. Agreeable personal characteristics and dependability are probably the most significant qualities of interest to an employer. Many of the jobs require moderate to heavy lifting and sophistication in the use of tools; therefore, handicapped workers who lack certain physical capabilities may need to be quite selective in seeking jobs. Communication barriers may also prohibit work in this area.

.868, .878

USHERING, MESSENGER SERVICE, AND RELATED WORK

Work activities primarily involve taking tickets, issuing programs, and escorting people to their seats in public places; assisting or escorting people into and out of buildings, conveyances, or facilities; running errands; and receiving and delivering messages. Requires the ability and willingness to follow instructions; an affinity for dealing with people; an inclination toward work of a routine, repetitive nature; willingness to wear a uniform; and physical stamina. (DOT, Vol. 2, p. 509)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED– Trainable	MENTALLY RETARDED– Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Newspaper Carrier									C		
Escort										C	
Messenger	C		C	C		C				C	

C = Competitive Employment

Other jobs in this group:

- Telegraph Messenger
- Vault Attendant (banking)
- Doorman
- Ticket Taker
- Usher
- Drive-In Theater Attendant

Opening jobs in this group:

The demands of these jobs vary considerably. Major barriers to handicapped workers are mobility, communication, and attitude barriers. Special training may augment skill development for slow learners. The time spent in training nonhandicapped workers is usually quite brief, and an individual is frequently expected to function in an efficient manner after a short demonstration or a limited breaking-in period.

.874, .877

ANIMAL CARE

Work activities involve providing for the welfare of animals. Typical activities are feeding, watering, sheltering, exercising, and grooming animals, and treating them for minor illnesses or injury. Requires a liking for animals and a sense of responsibility for their welfare; finger and manual dexterity; eye-hand-foot coordination; motor coordination; ability to adjust to routine work; and physical stamina. (DOT, Vol. 2, p. 511)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Dog Groomer, Helper	C										
Kennelman						C			C		

C = Competitive Employment

Other jobs in this group:

- Exerciser, Horse
- Animal Caretaker
- Veterinary-Hospital Attendant

Opening jobs in this group:

Opportunities for entry into these jobs exist in large metropolitan areas, where there are many pets and services for their care, and in rural locations where breeding, raising, and caring for animals is an important aspect of the local economy. Workers usually learn on the job by undertaking tasks according to their experience and capabilities. Severe mobility or coordination problems are likely to be difficult barriers to obtaining these jobs. Communication and attitudinal barriers, and lack of skill development should be more easily managed.

.868, .878

PROTECTING AND RELATED WORK

Work activities involve rendering services designed to defend the person, property, or rights of individuals, establishments, or the general public against injury, loss, or disturbance resulting from criminal or disorderly acts, unwanted intrusion, accidents, fire, or other hazards. Requires ability to exercise initiative in relating to people and adjusting to fluctuating situations; equanimity in the face of danger or resistance; manual dexterity and motor coordination for using firearms; honesty and dependability; and physical stamina. (DOT, Vol. 2, p. 427)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Guard	C		C		C	C			C	C	
Security Inspector							C				

C = Competitive Employment

Other jobs in this group:

- Process Server
- Armored-Car Guard
- Watchman
- Border Patrolman
- Detective
- Sheriff, Deputy
- Lifeguard
- Park Caretaker

Opening jobs in this group:

Because this work involves the protection of life and property, workers are usually required to undergo rigid training and to pass difficult tests before they qualify for jobs. Special training for qualified criminal investigation work may be helpful to selected handicapped workers, as such skills are in demand. Mobility and communication handicaps may prohibit work in some of these jobs unless adequate adaptive devices can be obtained and utilized.

.883

DRIVING--
OPERATING

Work activities involve starting, stopping, and moving the controls of machines which must be steered or guided in order to fabricate, process, and/or move materials and products. Requires spatial discrimination; eye-hand-foot coordination; manual dexterity; a preference for working with machines and equipment; the ability to follow instructions; and facility in adapting to routine, repetitive work. (DOT, Vol. 2, p. 444)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Truckdriver, Light			C							C	
Chauffeur									C	C	
Deliveryman				C						C	

C = Competitive Employment

Other jobs in this group:

- Vacuum-Cleaner Operator
- Farm Hand, Cotton
- Farm-Equipment Operator
- Bulldozer Operator
- Concrete-Mixing-Truck Driver
- Teamster
- Elevator Operator, Freight
- Tractor Operator

Opening jobs in this group:

The requirements for skill development and mobility in these jobs vary considerably. Jobs will be open to the nonvocal who can communicate by some other means. Severe mobility and coordination handicaps will prohibit working in these jobs. Skill development may be augmented by special training. Attitudinal barriers may be best managed by obtaining on-the-job training, if possible, to demonstrate competency.

.868, .878

MISCELLANEOUS PERSONAL SERVICE WORK
(food serving, portering, valeting, and related activities)

Work activities primarily involve attending to the personal needs and desires of individuals in regard to their consumption of food and drink in public places, the cleanliness of their clothing, conveyance of their luggage, cleanliness of their surrounding, and similar matters having to do with personal comfort, convenience and appearance. Requires ability and willingness to take, understand, and follow orders; a courteous and cheerful manner in dealing with the public; facility in adjusting to a routine; manual dexterity; cleanliness and freedom from communicable diseases. (DOT, Vol. 2, p. 507)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOG'CAL
Maid	C,S	C,S	C	C			C				
Valet						C					
Busboy (girl)	C,S	S	C	C	C	C					
Line Server			C								
Steam Table Attendant	C										
Counter Attendant, Cafeteria	C,S	S			C						
Salad Girl (boy)	C,S	S									
Crib Operator						C					
Fast Food Server	C			C							
Waiter	C,S		C	C						C	
Bartender			C								
Fountain/Snack Bar Attendant	C,S	S		C							
Bellboy	C										
Masseuse			C								
Porter			C								
Parking Lot Attendant	C,S					C		C		C	

C = Competitive Employment; S = Sheltered Workshop

131

Other jobs in this group:

- Farm HOusekeeper
- Manicurist
- Pin Boy (amusement and recreation)
- Caddie
- Bat Boy
- Steward
- Bootblack

Opening jobs in this group:

Many severely handicapped persons with a variety of handicapping conditions are presently holding jobs in this worker trait group. They are employed both in sheltered workshops and in competitive employment. Formal education is not a requirement for obtaining employment, although many employers prefer that employees have a high school education. Special courses may be given by hotel and restaurant associations or by individual establishments. Job redesign or simplification may be appropriate for some handicapping conditions. Persons with severe communication, mobility, or cosmetic handicaps may be prevented from working in some of these jobs.

.878

CHILD AND ADULT CARE

Activities involve assisting individuals who are totally or partially unable to care for themselves. Typical recipients of such care would be children in private homes or institutions and adults confined to hospitals or institutions. Requires patience and sympathy for problems of others; the ability to relate to people; stability under pressure; attentiveness and the ability to pay attention to detail; clean personal habits; freedom from communicable diseases; and some degree of manual and finger dexterity and motor coordination. (DOT, Vol. 2, p. 479)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Nurse Maid	C			C							
Companion			C	C							
Foster Grandparent			C								
Child Care Attendant, School	C										
Nurse's Aide	C		C	C	C	C	C	C		C	C
Orderly	C	C	C	C	C					C	
Physical Therapy Attendant				C						C	
Tray-Line Worker	C		C		C	C					
Teacher, Nursery School			C							C	
Teacher's Aide	C, S		C								

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Children's Matron
- Nurse, Practical
- Kindergarten Teacher

Opening jobs in this group:

Many severely handicapped workers are presently employed in the jobs in this worker trait group. Persons in all handicapping conditions are finding jobs in competitive employment. Barriers which may preclude employment are severe communication or mobility handicaps.

.884

MANIPULATING

Activities primarily involve the dexterous use of hands, hand tools, or special devices to work, move, guide, or place objects or materials. Some latitude exists for judgment in selecting the appropriate tools, objects, or materials and in determining work procedures and conformance to standards, although all these factors are fairly obvious. Requires eye-hand coordination; manual and finger dexterity; spatial and form perception; a decided preference for working with the hands; the ability to work within prescribed standards and specifications; and facility to adapting to a routine. (DOT, Vol. 2, p. 322)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Assembler (unspecified)		C,S									
Baker's Helper	C,S	S									
Pantry Man (salad maker)				C		C					
Sandwich Maker	C,S	S									
Laundryman, Hand	C										
Shoe Repairman Helper				C		C					
Laundry Operator										C	
Janitor			C	C		C	C		C	C	
Groundskeeper	C,S	S	C	C							
Auto-Mechanic Helper (rust proofer)			C								
Used Car Renovator	C					C			C		
Mechanics Helper	C, S		C								
Repairman II							C				
Maintenance Mechanic Helper	C										
Filer Polisher			C				C				
Assembler, Small Parts							C,S		C		
Bench Assembler			C	C						C	
Silkscreen Machine Operator						S					
Lens Polisher			C		C						
Denture Worker									C		
Assembler, Gold Frame									C		
Contact Lens Curve Grinder					C						
Appliance Repairman			C	C							
Mechanical Assembler							C				
Racket Stringer	C	S									
Broommaker				S	S						
Printer Helper	C										
Sander and Buffer	C		C								
Sander, Machine	C,S										
Chair Caner, Hand				S							

C = Competitive Employment; S = Sheltered Workshop

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Porcelain Dipper	C										
Grinding Wheel Dresser										C	
Upholstery Repairman										C	
Cloth Cutter		S	C,S	S			S				
Seamstress			C				C				
Leather Craftsman							C				
Leather Worker				C							
Production Line Assembler II											C
Welder, Arc			C	C							
Laboratory Helper			C								
Cableman										C	
Construction Worker			C								
Logger Helper	C										
Silkscreen Printer		S	S	S		S	S				

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Silverware Assembler
- Parking Meter Collector
- Food Assembler, Commissary Kitchen
- Sheep Shearer
- Fisherman, Net
- Pump Installer
- Bicycle Repairman
- Lock Assembler
- Fire Extinguisher Serviceman
- Surgical Forceps Fabricator
- Eyeglass Lens Cutter
- X-Ray-Screen Maker
- Picture Tube Installer
- Diamond Mounter
- Tire Builder
- Cooper
- Motorcycle Assembler
- Glass Installer
- Book Binder

Opening jobs in this group:

A large number of jobs in this worker trait group are already available for severely handicapped workers with a variety of handicapping conditions. Not only are these jobs available in competitive employment, but many of them are available in sheltered workshops which have been specifically designed to accommodate severely handicapped persons. Special training is often used to augment skills, and significant progress has recently been made with handicapped persons such as the severely mentally retarded. Severe orthopedic handicaps, which limit the manipulation of objects and tools, may prohibit work in these jobs. Communication handicaps are probably not critical, providing they can be circumvented by sign language and communication devices.

.886

FEEDING--
OFFBEARING

Work activities involve inserting, throwing, dumping or placing materials in or removing them from machines or equipment which are automatic, or are tended or operated by other workers. Requires physical stamina; motor coordination to carry out standardized tasks; ability and willingness to follow instructions; and finger and hand dexterity to position, feed, or otherwise work with objects in a standardized manner. (DOT, Vol. 2, p. 356)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Dry Cleaner Helper				C							
Baker Helper	C		C	C							
Film Processor										C	
Photographic Finisher I								C			
Printshop Helper	C										

C = Competitive Employment

Other jobs in this group:

- Cannery Worker
- Wood Preserver
- Bookbinder Helper
- Textile Machine Attendant

Opening jobs in this group:

Applicants for jobs in this worker trait group must meet the motor coordination, manual dexterity, and strength requirements which, of course, vary from job to job. Orthopedically handicapped persons will need to be assessed and may require additional training. As many jobs do not require high levels of communication, the inability to communicate may be managed by communication devices or special procedures. Pre-job training may be useful to give handicapped workers a competitive advantage. Many nonhandicapped workers are able to qualify for these jobs, but often do not seek them because of their repetitious nature; therefore, handicapped workers may enhance their success in obtaining these jobs by demonstrating high motivation and conscientiousness.

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TENDING

Work activities involve starting, stopping, and observing the functioning of machines and equipment. Workers are not concerned with setting up machines, but must be alert in changing guides, adjusting timers and temperature gauges, turning valves, pushing buttons, flipping switches, and making other minor adjustments. Requires an inclination toward working with machinery and equipment; the ability and willingness to learn and follow instructions; ease in adjusting to routine, repetitive work; and capacity for sustained attention to functioning of machines or equipment. (DOT, Vol. 2, p. 447)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Duplicating Machine Operator IV	C		C								
Xerox Machine Operator										C	
Laundryman			C			C					
Container Washer	C										
Paint Mixer, Machine			C			C				C	
Lathe Operator, Production	S					S					
Drill-Press Operator Helper	C	S									
Machine Operator	C										
Bindery Worker	C										
Offset-Press Operator II			C				C				
Printer		S		C							
Assembly-Press Operator	S										
Electric Sealing Machine Operator			C								
Fastener, Machine (boot and shoe)	C										
Kick-Press Operator	C			S							
Stapler, Machine	C	S									
Eyelet-Machine Operator		S	C	S			S				
Packager, Machine						C			C		
Baling-Machine Operator	S										
X-Ray Development Machine Operator				C							

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Folding Machine Operator
- Candy-Maker Helper
- Hopper Attendant (sugar)
- Cook, Fry, Deep Fat
- Bagger (fabrication, plastic products)
- Bulb Cleaner (electronics)
- Dyer, Machine

Opening jobs in this group:

Persons who have had some experience working with machines in a school or work environment are frequently preferred for these jobs. On-the-job training is the most common method by which workers attain competence. Physical and mobility requirements for these jobs will vary greatly depending upon the machine to be operated and the nature of the controls. Controls may be modified for the benefit of the individual handicapped worker. Communication barriers may not be a serious obstacle once skill is obtained. Special training prior to on-the-job training may be advisable to ensure the handicapped worker's confidence and to increase his or her experience.

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HANDLING

Work activities involve routine, nonmachine tasks involving little or no latitude for judgment. Adherence to rigid standards is not involved. Requires physical stamina; inclination toward routine, repetitive activities; some dexterity with fingers and hands; eye-hand coordination; form perception; and ability and willingness to follow instructions. (DOT, Vol. 2, p. 360)

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED–Trainable	MENTALLY RETARDED–Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Construction Man	C										
Repairman, General				C							
Sealant Helper	C										
Sorter II		S	C	S							
Stock-Clerk Helper	C										
Tool Clerk Helper	C										
Warehouseman Helper	C		C								
Sealing and Stamping, Hand	C	S									
Ironer, Hand		S									
Cook's Helper	C,S	S	C	C						C	
Salad-Maker, Helper	C,S	S									
Dishwasher	C		C								
Kitchen Helper	C,S	C,S		C	C	C	C		C		C
Houseman					C					C	
Maid II				C	C,S	C				C	
Maid, Hospital			C								
Supply Clerk										C	
Morgueman			C				C				
Laundry Laborer			C,S	C							
Washer, Hand	C,S	C	C								
Laundryman III	C			C							
Cleaner, Laboratory Equipment			C								
Porter (I & II)	C,S	C,S	C	C	C,S	C,S				C	C
Window Cleaner	C										
Farmhand, Vegetable II	C	C,S	C								
Foundry Worker, General			C	C							
Film Loader									C		
Machine Helper			C,S	C			S				
Refrigeration-Mechanic Helper				C							
Printer's Helper			C	C		C					

C = Competitive Employment; S = Sheltered Workshop

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED—Trainable	MENTALLY RETARDED—Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Oiler I	C										
Laborer, Grinding and Polishing										C	
Assembler, Production	C			C,S							
Laborer (unspecified)			C								
Laborer, Production				C,S		C					
Assembler, Electrical Accessories			C								
Wire Cutter	C,S										
Linker (jewelry)			C								
Sorter (unspecified)	C										
Stone Setter							C,S				
Assembler (munitions)							C,S				
Salvageman	C		S	C,S							
Assembler, Small Products	C						C				
Gluer			C								
Valve Fitter										C	
Woodworking Shophand	C	S									
Pallet Repairer	C										
Stapler, Hand Upholsterer		S								C	
Assembler I	C,S	S	C				C,S	S		C	
Clipper, String Cutter		S									
Folder, Hand		S									
Upholsterer, Auto			C				C				
Auto-Body Repairman Helper				C							
Welder Helper	C										
Painter Helper		S		C							
Laborer, Paving			C								
Carpenter Helper, Maintenance	C			C							
Laborer, Carpentry	C,S		C						C		
Laborer, Construction	C										
Bricklayer Helper				C							
Stonemason Helper				C							
Round-Up-Ring Man									C		
Maintenance-Man Helper, Building		C,S	C	C	C	C		C			
Truckdriver Helper	C		C		C	C					
Garbage Collector II	C										
Cleaner II (unspecified)		C	C								
Cleaner II (cars)	C										
Bagger, Hand	C										
Marker II	C	S		S						S	
Packager, Hand	C,S	C,S	C,S	C,S	C	C	C				

C = Competitive Employment; S = Sheltered Workshop

Jobs held by handicapped workers:

D.O.T. JOB TITLE	MENTALLY RETARDED— Trainable	MENTALLY RETARDED— Severe & Profound	EMOTIONALLY DISTURBED	MULTIPLY HANDICAPPED	EPILEPSY	CEREBRAL PALSY	PARAPLEGIC	QUADRIPLEGIC	OTHER ORTHOPEDIC	SEVERE HEALTH	SEVERE NEUROLOGICAL
Paper Boy	C			S							
Stenciler	S										
Laborer, Store	C			C	C	C			C		
Laborer, Warehouseman					C						
Loader (unspecified)			C								
Loader I (truck)	C										
Loader Helper	C										
Laborer, Salvage	C										
Car Cleaner	C										

C = Competitive Employment; S = Sheltered Workshop

Other jobs in this group:

- Medical Supply Clerk
- Handbill Passer
- Cutter, Press Clippings
- Mosquito Sprayer
- Tree Pruner
- Sandblaster
- Poultry Boner
- Foam Rubber Trimmer
- Rug Cleaner
- Polisher (jewelry)
- Gas Meter Repairman Helper
- Record-Changer Assembly
- Hand Finisher, Bowling Balls
- Blasting-Cap Assembler
- Tire Mounter
- Woodworking Shop Hand
- Glass Cutter, Machine
- Last Puller (boot and shoe)
- Longshoreman
- Street Cleaner

Opening jobs in this group:

The most important hiring factor for jobs in this worker trait group is the ability of the applicant to meet the strength requirements which range from light to very heavy. Because many nonhandicapped applicants can qualify for these jobs, personal characteristics such as reliability, honesty, and industry will play a significant role in job retention for the handicapped. Workers with orthopedic handicaps will be excluded from many of these jobs. Communication and learning handicaps need not be serious barriers if appropriate strategies are used to manage them. Since many severely handicapped persons are presently working on jobs in this worker trait group, attitudes would not seem to be a major barrier.

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AIDS AND DEVICES

Below is a list of aids and devices referred to in this handbook, along with addresses of the companies where they can be obtained. This is not intended to be a comprehensive list of available products.

1. Adjustable Wheelchair

    Motorette Corporation
    6014 Reseda Blvd.
    Tarzana, CA 91356

2. Braille and "Talking" Calculators

    A.F.B. Calculator
    American Foundation for the Blind
    15 West 16th St.
    New York, NY 10011

    Calcu-Tac Model T8B (braille output on paper tape--scientific calculator)
    Science for the Blind
    221 Rock Hill Rd.
    Bala Cynwyd, PA 19004

    A.R.C. Model 9500 (talking)
    Master Specialties Company
    647 Babcock Rd.
    Costa Mesa, CA 92627

    Speech Plus Talking Calculator
    Telesensory Systems, Inc.
    1889 Page Mill Rd.
    Palo Alto, CA 94304

3. E-Z Reacher

    Physical Aids Manufacturing Co.
    4848 Ronson Ct.
    San Diego, CA 92111

4. OPTACON

    Telesensory Systems, Inc.
    1889 Page Mill Rd.
    Palo Alto, CA 94304

5. Braille Computer

    Protestant Guild for the Blind
    465 Belmont St.
    Watertown, MA 02172

6. Sensory Aids Catalog (forthcoming)

Sensory Aids Foundation
399 Sherman Ave.
Palo Alto, CA 94306

7. Stereotoner

Mauch Laboratories, Inc.
3035 Dryden Rd.
Dayton, OH 45439

8. Telephone Add-Ons

Contact any telephone company business office. The Bell Telephone System's booklet, "Services for Special Needs," which describes telephone modifications, is available upon request.

9. Braille Computer Terminal

Triformation Systems, Inc.
P.O. Box 2433
Stuart, FL 33494

10. Prostheses

Veteran's Administration
Research Center for Prosthetics
252 Seventh Ave.
New York, NY 10001

ASSOCIATIONS AND COMMITTEES

1. American Mutual Insurance Alliance
20 North Wacker Dr.
Chicago, IL 60606

2. Chamber of Commerce of the U.S.
1615 H St. N.W.
Washington, D.C. 20006

3. National Association of Manufacturers
Employee Relations Division
277 Park Ave.
New York, NY 10805

4. President's Committee on Employment of the Handicapped
Washington, D.C. 20210

PROGRAMS

1. Children's Hospital at Stanford
Rehabilitation Engineering Center
Stanford, CA 94305

2. Regional Transportation District
Special Needs Program
1325 So. Colorado Blvd.
Denver, CO 80222

3. Trace Research and Development Center for the Severely Communicatively Impaired
University of Wisconsin
922 E.R.B.
1500 Johnson Dr.
Madison, WI 53706

appendix

THE DICTIONARY OF OCCUPATIONAL TITLES

The Dictionary of Occupational Titles (DOT) is a standard source of occupational information, developed and printed by the U.S. Department of Labor. There are two volumes and a supplement. Volume I consists of names and definitions of the various occupations in the economy, arranged alphabetically according to job title. To help the user discern relationships among occupations, Volume II groups jobs that have the same basic occupational, industrial, or worker characteristics. Detailed descriptions of worker trait groups are also included in Volume II. The Supplement to the Dictionary of Occupational Titles lists individual physical demands, working conditions, and training time data for each job defined in the DOT. It is arranged numerically according to the DOT job title code numbers.

The DOT presents an extensive amount of information that has been collected, analyzed, and coded. The following excerpt from the DOT explains the codes. This explanation will help you understand and interpret the DOT job title code numbers.

How the Placement Counselor Can Use the Dictionary of Occupational Titles

As an individual concerned with the placement of handicapped persons, you might find the DOT a useful supplement to the worker trait group models in this handbook. Specifically, the following steps might be completed as part of the process of finding additional information about a job:

1. Refer to the specific worker trait group sections in the DOT, Volume II. To locate a specific job category, first locate the title of the job in Volume I and write down the six-digit code number associated with that job. Next, refer to Volume II and find the appropriate worker trait group in the section headed Worker Trait Groups Within Areas of Work. After you have found the worker trait group, locate the page number in the right-hand column. On this page you will find a description of the worker trait group characteristics. (Note: The Supplement to the Dictionary of Occupational Titles can also be used to find this information. The supplement is organized according to the DOT six-digit code numbers. Next to each code number entry you will find the page number for the worker trait group description in Volume II.)

2. Turn to the appropriate page number in Volume II and read the worker trait group description. Pay particular attention to the requirements of the job, the qualifications profile, the training, and the entry methods. Also note the list of related jobs, which is an excellent guide to additional sources of employment.

3. Once the job requirements and qualifications have been identified, refer to the barrier tables in this handbook to read about possible strategies that may be used to overcome these barriers.

4. Finally, develop a strategy to prepare the handicapped worker to locate and secure the desired job.

The following examples illustrate how the DOT can be used to assist clients in locating and pursuing jobs.

Example One: A quadriplegic client wants to find work as a programmer.

Procedure:

1. Identify the job skill category in Volume I by locating the job title Programmer, Business.

2. Write down the DOT code number 020.188.

3. In Volume II refer to the section headed Worker Trait Groups Within Areas of Work. Find the general heading--in this case, Accounting, Auditing, and Related Work. Note the page number listed in the right-hand column. (Or, you may refer to the DOT code number 020.188 in the Supplement to the Dictionary of Occupational Titles in order to locate the appropriate page number in Volume II.)

4. Turn to the appropriate page--in this case, page 252.

5. Read pages 252 and 253 (see Appendix pp. 157-158).

6. Identify the job requirements and/or qualifications that are potential barriers for your client. In this case, for example, your client might require a specially adapted programming machine, typewriter, or adding machine.

7. Refer to the barrier tables in this handbook and identify the barriers that seem to apply to your client. Read the strategies suggested for overcoming the barriers.

8. Discuss the barriers and strategies with your client to determine how he/she would like to approach management of the barriers. Depending upon the client's suggestions, you might meet with employers, state rehabilitation counselors, special education counselors, or other resource people to develop a strategy for successfully placing your client.

Example Two: A deaf and mentally retarded client seeks work as an assembly worker.

Procedure:

1. Identify the job skill category in Volume I by locating the job title and the appropriate type of assembler. In this case, the title might be Assembler (Fabricator).

2. Write down the DOT code number 754.884.

3. In Volume II refer to the section headed Worker Trait Groups Within Areas of Work. Find the general heading--in this case, Sorting, Inspecting, Measuring, and Related Work, under the subheading Clerical Work. Note the page number listed in the right-hand column. (Or, you may refer to the DOT code number 754.884 in the Supplement to the Dictionary of Occupational Titles in order to locate the appropriate page number in Volume II.)

4. Turn to the appropriate page--in this case, page 322.

5. Read page 322 and then scan pages 323-331, which list related job titles (see Appendix pp. 159-160).

6. Identify the job requirements and/or qualifications that are potential barriers for your client--in this this case, for example, tasks that are too complex, tasks that require eyesight, or lack of structure on the job.

7. Refer to the barrier tables in this handbook and identify the barriers that seem to apply to your client. Read the strategies for overcoming the barriers.

8. Discuss the barriers and strategies with your client to determine how he/she would like to approach management of the barriers. Depending upon the client's suggestions, you might meet with employers, state rehabilitation counselors, special education counselors, or other resource people to develop a strategy for successfully placing your client.

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Explanation of Relationships Within Data, People, Things Hierarchies

Much of the information in this edition of the Dictionary is based on the premise that every job requires a worker to function in relation to Data, People, and Things, in varying degrees. These relationships are identified and explained below. They appear in the form of three hierarchies arranged in each instance from the relatively simple to the complex in such a manner that each successive relationship includes those that are simpler and excludes the more complex.[1] The identifications attached to these relationships are referred to as worker functions, and provide standard terminology for use in summarizing exactly what a worker does on the job by means of one or more meaningful verbs.

A job's relationship to Data, People, and Things can be expressed in terms of the highest appropriate function in each hierarchy to which the worker has an occupationally significant relationship, and these functions taken together indicate the total level of complexity at which he must perform. The last three digits of the occupational code numbers in the Dictionary reflect significant relationships to Data, People, and Things, respectively.[2] These last three digits express a job's relationship to Data, People, and Things by identifying the highest appropriate function in each hierarchy to which the job requires the worker to have a significant relationship, as reflected by the following table:

	DATA (4th digit)		PEOPLE (5th digit)		THINGS (6th digit)
0	Synthesizing	0	Mentoring	0	Setting-Up
1	Coordinating	1	Negotiating	1	Precision Working
2	Analyzing	2	Instructing	2	Operating-Controlling
3	Compiling	3	Supervising	3	Driving-Operating
4	Computing	4	Diverting	4	Manipulating
5	Copying	5	Persuading	5	Tending
6	Comparing	6	Speaking-Signaling	6	Feeding-Offbearing
7	No significant relationship	7	Serving	7	Handling
8		8	No significant relationship	8	No significant relationship

DATA: Information, knowledge, and conceptions, related to data, people, or things, obtained by observation, investigation, interpretation, visualization, mental creation; incapable of being touched; written data take the form of numbers, words, symbols; other data are ideas, concepts, oral verbalization.

0 **Synthesizing:** Integrating analyses of data to discover facts and/or develop knowledge concepts or interpretations.

1 **Coordinating:** Determining time, place, and sequence of operations or action to be taken on the basis of analysis of data; executing determinations and/or reporting on events.

2 **Analyzing:** Examining and evaluating data. Presenting alternative actions in relation to the evaluation is frequently involved.

3 **Compiling:** Gathering, collating, or classifying information about data, people, or things. Reporting and/or carrying out a prescribed action in relation to the information is frequently involved.

4 **Computing:** Performing arithmetic operations and reporting on and/or carrying out a prescribed action in relation to them. Does not include counting.

5 **Copying:** Transcribing, entering, or posting data.

6 **Comparing:** Judging the readily observable functional, structural, or compositional characteristics (whether similar to or divergent from obvious standards) of data, people, or things.

PEOPLE: Human beings; also animals dealt with on an individual basis as if they were human.

0 **Mentoring:** Dealing with individuals in terms of their total personality in order to advise, counsel, and/or guide them with regard to problems that may be resolved by legal, scientific, clinical, spiritual, and/or other professional principles.

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[1] As each of the relationships to *People* represents a wide range of complexity, resulting in considerable overlap among occupations, their arrangement is somewhat arbitrary and can be considered a hierarchy only in the most general sense.

[2] Only those relationships which are occupationally significant in terms of the requirements of the job are reflected in the code numbers. The incidental relationships which every worker has to Data, *People*, and Things, but which do not seriously affect successful performance of the essential duties of the job, are not reflected.

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1 **Negotiating:** Exchanging ideas, information, and opinions with others to formulate policies and programs and/or arrive jointly at decisions, conclusions, or solutions.

2 **Instructing:** Teaching subject matter to others, or training others (including animals) through explanation, demonstration, and supervised practice; or making recommendations on the basis of technical disciplines.

3 **Supervising:** Determining or interpreting work procedures for a group of workers, assigning specific duties to them, maintaining harmonious relations among them, and promoting efficiency.

4 **Diverting:** Amusing others.

5 **Persuading:** Influencing others in favor of a product, service, or point of view.

6 **Speaking-Signaling:** Talking with and/or signaling people to convey or exchange information. Includes giving assignments and/or directions to helpers or assistants.

7 **Serving:** Attending to the needs or requests of people or animals or the expressed or implicit wishes of people. Immediate response is involved.

THINGS: Inanimate objects as distinguished from human beings; substances or materials; machines, tools, equipment; products. A thing is tangible and has shape, form, and other physical characteristics.

0 **Setting Up:** Adjusting machines or equipment by replacing or altering tools, jigs, fixtures, and attachments to prepare them to perform their functions, change their performance, or restore their proper functioning if they break down. Workers who set up one or a number of machines for other workers or who set up and personally operate a variety of machines are included here.

1 **Precision Working:** Using body members and/or tools or work aids to work, move, guide, or place objects or materials in situations where ultimate responsibility for the attainment of standards occurs and selection of appropriate tools, objects, or materials, and the adjustment of the tool to the task require exercise of considerable judgment.

2 **Operating-Controlling:** Starting, stopping, controlling, and adjusting the progress of machines or equipment designed to fabricate and/or process objects or materials. Operating machines involves setting up the machine and adjusting the machine or material as the work progresses. Controlling equipment involves observing gages, dials, etc., and turning valves and other devices to control such factors as temperature, pressure, flow of liquids, speed of pumps, and reactions of materials. Setup involves several variables and adjustment is more frequent than in tending.

3 **Driving-Operating:** Starting, stopping, and controlling the actions of machines or equipment for which a course must be steered, or which must be guided, in order to fabricate, process, and/or move things or people. Involves such activities as observing gages and dials; estimating distances and determining speed and direction of other objects; turning cranks and wheels; pushing clutches or brakes; and pushing or pulling gear lifts or levers. Includes such machines as cranes, conveyor systems, tractors, furnace charging machines, paving machines and hoisting machines. Excludes manually powered machines, such as handtrucks and dollies, and power assisted machines, such as electric wheelbarrows and handtrucks.

4 **Manipulating:** Using body members, tools, or special devices to work, move, guide, or place objects or materials. Involves some latitude for judgment with regard to precision attained and selecting appropriate tool, object, or material, although this is readily manifest.

5 **Tending:** Starting, stopping, and observing the functioning of machines and equipment. Involves adjusting materials or controls of the machine, such as changing guides, adjusting timers and temperature gages, turning valves to allow flow of materials, and flipping switches in response to lights. Little judgment is involved in making these adjustments.

6 **Feeding-Offbearing:** Inserting, throwing, dumping, or placing materials in or removing them from machines or equipment which are automatic or tended or operated by other workers.

7 **Handling:** Using body members, handtools, and/or special devices to work, move, or carry objects or materials. Involves little or no latitude for judgment with regard to attainment of standards or in selecting appropriate tool, object, or material.

NOTE: Included in the concept of Feeding-Offbearing, Tending, Operating-Controlling, and Setting Up, is the situation in which the worker is actually part of the setup of the machine, either as the holder and guider of the material or holder and guider of the tool.

Explanation of Worker Trait Components

Those abilities, personal traits, and individual characteristics required of a worker in order to achieve average successful job performance are referred to as worker traits. Occupational information presented in volumes I and II is based in part on analysis of required worker traits in terms of the six distinct worker trait components described in this appendix. These six components have been selected for this purpose because they provide the broadest and yet most comprehensive framework for the effective presentation of worker trait information. Within this framework the user will find data concerning the requirements of jobs for: (1) The amount of general educational development and specific vocational preparation a worker must have, (2) the specific capacities and abilities required of him in order to learn or perform certain tasks or duties, (3) preferences for certain types of work activities or experiences considered necessary for job success, (4) types of occupational situations to which an individual must adjust, (5) physical activities required in work situations, and (6) physical surroundings prevalent in jobs.

Information reflecting significant worker trait requirements is contained, explicitly or by implication, in the job definitions in volume I. In the Worker Traits Arrangement in volume II, the qualifications profile for each worker trait group shows the range of required traits and/or levels of traits for the first five of these components. Numbers or letters are used to identify each specific trait and level. In this appendix, these identifying numbers and letters appear in italics.

The worker trait components are:

I. Training time (general educational development, specific vocational preparation)
II. Aptitudes
III. Interests
IV. Temperaments
V. Physical demands
VI. Working conditions [1]

I. Training Time

The amount of general educational development and specific vocational preparation required for a worker to acquire the knowledge and abilities necessary for average performance in a particular job.

General Educational Development: This embraces those aspects of education (formal and informal) which contribute to the worker's (a) reasoning development and ability to follow instructions, and (b) acquisition of "tool" knowledges, such as language and mathematical skills. It is education of a general nature which does not have a recognized, fairly specific, occupational objective. Ordinarily such education is obtained in elementary school, high school, or college. It also derives from experience and individual study.

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[1] Working conditions were recorded as part of each job analysis, and are reflected, when appropriate, in job definitions in volume I. However, because they did not contribute to the homogeneity of worker trait groups, they do not appear as a component in the Worker Traits Arrangement.

The following is a table explaining the various levels of general educational development.

GENERAL EDUCATIONAL DEVELOPMENT

Level	Reasoning Development	Mathematical Development	Language Development
6	Apply principles of logical or scientific thinking to a wide range of intellectual and practical problems. Deal with nonverbal symbolism (formulas, scientific equations, graphs, musical notes, etc.) in its most difficult phases. Deal with a variety of abstract and concrete variables. Apprehend the most abstruse classes of concepts.	Apply knowledge of advanced mathematical and statistical techniques such as differential and integral calculus, factor analysis, and probability determination, or work with a wide variety of theoretical mathematical concepts and make original applications of mathematical procedures, as in empirical and differential equations.	Comprehension and expression of a level to —Report, write, or edit articles for such publications as newspapers, magazines, and technical or scientific journals. Prepare and draw up deeds, leases, wills, mortgages, and contracts. —Prepare and deliver lectures on politics, economics, education, or science. —Interview, counsel, or advise such people as students, clients, or patients, in such matters as welfare eligibility, vocational rehabilitation, mental hygiene, or marital relations. —Evaluate engineering technical data to design buildings and bridges.
5	Apply principles of logical or scientific thinking to define problems, collect data, establish facts, and draw valid conclusions. Interpret an extensive variety of technical instructions, in books, manuals, and mathematical or diagrammatic form. Deal with several abstract and concrete variables.		
4	Apply principles of rational systems[1] to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.	Perform ordinary arithmetic, algebraic, and geometric procedures in standard, practical applications.	Comprehension and expression of a level to —Transcribe dictation, make appointments for executive and handle his personal mail, interview and screen people wishing to speak to him, and write routine correspondence on own initiative. —Interview job applicants to determine work best suited for their abilities and experience, and contact employers to interest them in services of agency. —Interpret technical manuals as well as drawings and specifications, such as layouts, blueprints, and schematics.
3	Apply common sense understanding to carry out instructions furnished in written, oral, or diagrammatic form. Deal with problems involving several concrete variables in or from standardized situations.	Make arithmetic calculations involving fractions, decimals and percentages.	Comprehension and expression of a level to —File, post, and mail such material as forms, checks, receipts, and bills. —Copy data from one record to another, fill in report forms, and type all work from rough draft or corrected copy. —Interview members of household to obtain such information as age, occupation, and number of children, to be used as data for surveys, or economic studies. —Guide people on tours through historical or public buildings, describing such features as size, value, and points of interest.
2	Apply common sense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.	Use arithmetic to add, subtract, multiply, and divide whole numbers.	
1	Apply common sense understanding to carry out simple one- or two-step instructions. Deal with standardized situations with occasional or no variables in or from these situations encountered on the job.	Perform simple addition and subtraction, reading and copying of figures, or counting and recording.	Comprehension and expression of a level to —Learn job duties from oral instructions or demonstration. —Write identifying information, such as name and address of customer, weight, number, or type of product, on tags, or slips. —Request orally, or in writing, such supplies as linen, soap, or work materials.

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[1] Examples of "principles of rational systems" are: Bookkeeping, internal combustion engines, electric wiring systems, house building, nursing, farm management, ship sailing.

Specific Vocational Preparation: The amount of time required to learn the techniques, acquire information, and develop the facility needed for average performance in a specific job-worker situation. This training may be acquired in a school, work, military, institutional, or avocational environment. It does not include orientation training required of even every fully qualified worker to become accustomed to the special conditions of any new job. Specific vocational training includes training given in any of the following circumstances:

a. Vocational education (such as high school commercial or shop training, technical school, art school, and that part of college training which is organized around a specific vocational objective);
b. Apprentice training (for apprenticeable jobs only);
c. In-plant training (given by an employer in the form of organized classroom study);
d. On-the-job training (serving as learner or trainee on the job under the instruction of a qualified worker);
e. Essential experience in other jobs (serving in less responsible jobs which lead to the higher grade job or serving in other jobs which qualify).

The following is an explanation of the various levels of specific vocational preparation.

Level	*Time*	*Level*	*Time*
1	Short demonstration only.	*5*	Over 6 months up to and including 1 year.
2	Anything beyond short demonstration up and including 30 days.	*6*	Over 1 year up to and including 2 years.
3	Over 30 days up to and including 3 months.	7	Over 2 years up to and including 4 years.
4	Over 3 months up to and including 6 months.	*8*	Over 4 years up to and including 10 years.
		9	Over 10 years.

II. APTITUDES

Specific capacities and abilities required of an individual in order to learn or perform adequately a task or job duty.

G INTELLIGENCE: General learning ability. The ability to "catch on" or understand instructions and underlying principles. Ability to reason and make judgments. Closely related to doing well in school.

V VERBAL: Ability to understand meanings of words and ideas associated with them, and to use them effectively. To comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs. To present information or ideas clearly.

N NUMERICAL: Ability to perform arithmetic operations quickly and accurately.

S SPATIAL: Ability to comprehend forms in space and understand relationships of plane and solid objects. May be used in such tasks as blueprint reading and in solving geometry problems. Frequently described as the ability to "visualize" objects of two or three dimensions, or to think visually of geometric forms.

P FORM PERCEPTION: Ability to perceive pertinent detail in objects or in pictorial or graphic material; To make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q CLERICAL PERCEPTION: Ability to perceive pertinent detail in verbal or tabular material. To observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

K MOTOR COORDINATION: Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and quickly.

F FINGER DEXTERITY: Ability to move the fingers and manipulate small objects with the fingers rapidly or accurately.

M MANAUL DEXTERITY: Ability to move the hands easily and skillfully. To work with the hands in placing and turning motions.

E EYE-HAND-FOOT COORDINATION: Ability to move the hand and foot coordinately with each other in accordance with visual stimuli.

C COLOR DISCRIMINATION: Ability to perceive or recognize similarities or differences in colors, or in shades or other values of the same color; to identify a particular color, or to recognize harmonious or contrasting color combinations, or to match colors accurately.

Explanation of Levels

The digits indicate how much of each aptitude the job requires for satisfactory (average) performance. The average requirements, rather than maximum or minimum, are cited. The amount required is expressed in terms of equivalent amounts possessed by segments of the general working population.

The following scale is used:

1 The top 10 percent of the population. This segment of the population possesses an extremely high degree of the aptitude.

2 The highest third exclusive of the top 10 percent of the population. This segment of the population possesses an above average or high degree of the aptitude.

3 The middle third of the population. This segment of the population possesses a medium degree of the aptitude, ranging from slightly below to slightly above average.

4 The lowest third exclusive of the bottom 10 percent of the population. This segment of the population possesses a below average or low degree of the aptitude.

5 The lowest 10 percent of the population. This segment of the population possesses a negligible degree of the aptitude.

Significant Aptitudes

Certain aptitudes appear in boldface type on the qualifications profiles for the worker trait groups. These aptitudes are considered to be occupationally significant for the specific group; i.e., essential for average successful job performance. All boldface aptitudes are not necessarily required of a worker for each individual job within a worker trait group, but some combination of them is essential in every case.

III. INTERESTS

Preferences for certain types of work activities or experiences, with accompanying rejection of contrary types of activities or experiences. Five pairs of interest factors are provided so that a positive preference for one factor of a pair also implies rejection of the other factor of that pair.

1	Situations involving a preference for activities dealing with things and objects.	vs.	*6*	Situations involving a preference for activities concerned with people and the communication of ideas.
2	Situations involving a preference for activities involving business contact with people.	vs.	*7*	Situations involving a preference for activities of a scientific and technical nature.
3	Situations involving a preference for activities of a routine, concrete, organized nature.	vs.	*8*	Situations involving a preference for activities of an abstract and creative nature.
4	Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations.	vs.	*9*	Situations involving a preference for activities that are nonsocial in nature, and are carried on in relation to processes, machines, and techniques.
5	Situations involving a preference for activities resulting in prestige or the esteem of others.	vs.	*0*	Situations involving a preference for activities resulting in tangible, productive satisfaction.

IV. TEMPERAMENTS

Different types of occupational situations to which workers must adjust.

1 Situations involving a variety of duties often characterized by frequent change.
2 Situations involving repetitive or short cycle operations carried out according to set procedures or sequences.
3 Situations involving doing things only under specific instruction, allowing little or no room for independent action or judgment in working out job problems.
4 Situations involving the direction, control, and planning of an entire activity or the activities of others.
5 Situations involving the necessity of dealing with people in actual job duties beyond giving and receiving instructions.
6 Situations involving working alone and apart in physical isolation from others, although the activity may be integrated with that of others.
7 Situations involving influencing people in their opinions, attitudes, or judgments about ideas or things.
8 Situations involving performing adequately under stress when confronted with the critical or unexpected or when taking risks.
9 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against sensory or judgmental criteria.
0 Situations involving the evaluation (arriving at generalizations, judgments, or decisions) of information against measurable or verifiable criteria.
X Situations involving the interpretation of feelings, ideas, or facts in terms of personal viewpoint.
Y Situations involving the precise attainment of set limits, tolerances, or standards.

V. PHYSICAL DEMANDS

Physical demands are those physical activities required of a worker in a job.

The physical demands referred to in this Dictionary serve as a means of expressing both the physical requirements of the job and the physical capacities (specific physical traits) a worker must have to meet the requirements. For example, "seeing" is the name of a physical demand required by many jobs (perceiving by the sense of vision), and also the name of a specific capacity possessed by many people (having the power of sight). The worker must possess physical capacities at least in an amount equal to the physical demands made by the job.

The Factors

1 **Lifting, Carrying, Pushing, and/or Pulling** (**Strength**). These are the primary "strength" physical requirements, and generally speaking, a person who engages in one of these activities can engage in all.

Specifically, each of these activities can be described as:

(1) Lifting: Raising or lowering an object from one level to another (includes upward pulling).
(2) Carrying: Transporting an object, usually holding it in the hands or arms or on the shoulder.
(3) Pushing: Exerting force upon an object so that the object moves away from the force (includes slapping, striking, kicking, and treadle actions).
(4) Pulling: Exerting force upon an object so that the object moves toward the force (includes jerking).

The five degrees of Physical Demands Factor No. 1 (Lifting, Carrying, Pushing, and/or Pulling), are as follows:

S Sedentary Work

Lifting 10 lbs. maximum and occasionally lifting and/or carrying such articles as dockets, ledgers, and small tools. Although a sedentary job is defined as one which involves sitting, a certain amount of walking and standing is often necessary in carrying out job duties. Jobs are sedentary if walking and standing are required only occasionally and other sedentary criteria are met.

L Light Work

Lifting 20 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 10 lbs. Even though the weight lifted may be only a negligible amount, a job is in this category when it requires walking or standing to a significant degree, or when it involves sitting most of the time with a degree of pushing and pulling of arm and/or leg controls.

M Medium Work

Lifting 50 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 25 lbs.

H Heavy Work

Lifting 100 lbs. maximum with frequent lifting and/or carrying of objects weighing up to 50 lbs.

V Very Heavy Work

Lifting objects in excess of 100 lbs. with frequent lifting and/or carrying of objects weighing 50 lbs. or more.

2 **Climbing and/or Balancing:**

(1) Climbing: Ascending or descending ladders, stairs, scaffolding, ramps, poles, ropes, and the like, using the feet and legs and/or hands and arms.
(2) Balancing: Maintaining body equilibrium to prevent falling when walking, standing, crouching, or running on narrow, slippery, or erratically moving surfaces; or maintaining body equilibrium when performing gymnastic feats.

3 **Stooping, Kneeling, Crouching, and/or Crawling:**

(1) Stooping: Bending the body downward and forward by bending the spine at the waist.
(2) Kneeling: Bending the legs at the knees to come to rest on the knee or knees.
(3) Crouching: Bending the body downward and forward by bending the legs and spine.
(4) Crawling: Moving about on the hands and knees or hands and feet.

4 **Reaching, Handling, Fingering, and/or Feeling:**

(1) Reaching: Extending the hands and arms in any direction.
(2) Handling: Seizing, holding, grasping, turning, or otherwise working with the hand or hands (fingering not involved).
(3) Fingering: Picking, pinching, or otherwise working with the fingers primarily (rather than with the whole hand or arm as in handling).
(4) Feeling: Perceiving such attributes of objects and materials as size, shape, temperature, or texture, by means of receptors in the skin, particularly those of the finger tips.

5 **Talking and/or Hearing:**

(1) Talking: Expressing or exchanging ideas by means of the spoken word.
(2) Hearing: Perceiving the nature of sounds by the ear.

6 **Seeing:**

Obtaining impressions through the eyes of the shape, size, distance, motion, color, or other characteristics of objects. The major visual functions are: (1) acuity, far and near, (2) depth perception, (3) field of vision, (4) accommodation, (5) color vision. The functions are defined as follows:

(1) Acuity, far—clarity of vision at 20 feet or more.
Acuity, near—clarity of vision at 20 inches or less.
(2) Depth perception—three dimensional vision. The ability to judge distance and space relationships so as to see objects where and as they actually are.
(3) Field of vision—the area that can be seen up and down or to the right or left while the eyes are fixed on a given point.

(4) Accommodation—adjustment of the lens of the eye to bring an object into sharp focus. This item is especially important when doing near-point work at varying distances from the eye.
(5) Color vision—the ability to identify and distinguish colors.

VI. WORKING CONDITIONS

Working conditions are the physical surroundings of a worker in a specific job.

1 Inside, Outside, or Both:

I Inside: Protection from weather conditions but not necessarily from temperature changes.
O Outside: No effective protection from weather.
B Both: Inside and outside.

A job is considered "inside" if the worker spends approximately 75 per cent or more of his time inside, and "outside" if he spends approximately 75 per cent or more of his time outside. A job is considered "both" if the activities occur inside or outside in approximately equal amounts.

2 Extremes of Cold Plus Temperature Changes:

(1) Extremes of Cold: Temperature sufficiently low to cause marked bodily discomfort unless the worker is provided with exceptional protection.
(2) Temperature Changes: Variations in temperature which are sufficiently marked and abrupt to cause noticeable bodily reactions.

3 Extremes of Heat Plus Temperature Changes:

(1) Extremes of Heat: Temperature sufficiently high to cause marked bodily discomfort unless the worker is provided with exceptional protection.
(2) Temperature Changes: Same as 2 (2).

4 Wet and Humid:

(1) Wet: Contact with water or other liquids.
(2) Humid: Atmospheric condition with moisture content sufficiently high to cause marked bodily discomfort.

5 Noise and Vibration:

Sufficient noise, either constant or intermittent, to cause marked distraction or possible injury to the sense of hearing and/or sufficient vibration (production of an oscillating movement or strain on the body or its extremities from repeated motion or shock) to cause bodily harm if endured day after day.

6 Hazards:

Situations in which the individual is exposed to the definite risk of bodily injury.

7 Fumes, Odors, Toxic Conditions, Dust, and Poor Ventilation:

(1) Fumes: Smoky or vaporous exhalations, usually odorous, thrown off as the result of combustion or chemical reaction.
(2) Odors: Noxious smells, either toxic or nontoxic.
(3) Toxic Conditions: Exposure to toxic dust, fumes, gases, vapors, mists, or liquids which cause general or localized disabling conditions as a result of inhalation or action on the skin.
(4) Dust: Air filled with small particles of any kind, such as textile dust, flour, wood, leather, feathers, etc., and inorganic dust, including silica and asbestos, which make the workplace unpleasant or are the source of occupational diseases.
(5) Poor Ventilation: Insufficient movement of air causing a feeling of suffocation; or exposure to drafts.

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ACCOUNTING, AUDITING, AND RELATED WORK

.188; .288

Work Performed

Work activities in this group primarily involve the application of the principles of accounting, cost analysis, and statistical analysis to problems of fiscal management, auditing, and the like. Typically, workers are engaged in devising accounting systems and procedures; appraising assets and evaluating costing methods, investment programs, and monetary risks and rates; and preparing statistical tabulations and diagrams and financial reports, statements, and schedules for use by management.

Worker Requirements

An occupationally significant combination of: Ability to concentrate for long periods; good vocabulary and verbal expression; organizational ability; speed and accuracy in making numerical determinations; memory for detail; and the ability to understand the principles of accounting, statistics, and fiscal management.

Clues for Relating Applicants and Requirements

Level of attainment in language and mathematics as indicated by scores on aptitude tests and grades in educational courses.

Interest in working with numbers.

Interest in business activities.

Positions held (treasurer) in social and other organizations.

Training and Methods of Entry

A bachelor's degree in accounting and business administration is usually the minimum requirement for entrance into this work.

Adequate academic preparation should include courses in all phases of accounting and statistics, industrial and personnel management, marketing techniques, money and banking, investments, and insurance. Individuals with a degree qualify for many beginning jobs in budgeting, cost accounting, sales, or marketing, either in Government or private industry.

Positions entailing a degree of responsibility are usually reserved for those who have obtained a CPA (certified public accountant) certificate by passing rigorous examinations and meeting the educational and experience requirements prescribed by law in each State. Although most States require a college degree and 2 years of experience, requirements do vary and information on registration and certification should be obtained directly from the State board of accountancy in the State where the individual plans to practice.

RELATED CLASSIFICATIONS

Administration (.118; .168) p. 237
Computing and Related Recording (.388; .488) p. 280
Consultative and Business Services (.168; .268) p. 248

QUALIFICATIONS PROFILE

GED: 5
SVP: 7 8

Apt:	GVN	SPQ	KFM	EC
	1 2 1	4 4 2	4 4 4	5 5
	2 1 2		3 3 3	

Int: 1 7 9
Temp: 4 9 0 Y
Phys. Dem: S 4 6

16 ADMINISTRATIVE SPECIALTIES

160. Accounting and Auditing

160.188 Accountant (profes. & kin.)
  Accountant, Budget (profes. & kin.)
  Accountant, Cost (profes. & kin.)
  Accountant, Machine Processing (profes. & kin.)
  Accountant, Property (profes. & kin.)
  Accountant, Systems (profes. & kin.)
  Accountant, Tax (profes. & kin.)
 Auditor (profes. & kin.)
  Auditor, Internal (profes. & kin.)

160.188 Bursar (education))
Con.
160.288 Credit Analyst, Chief (banking)
 Director, Utility Accounts (gov. ser.)

161. Budget and Management Analysis

161.188 Valuation Engineer (profes. & kin.)
  Rate Engineer (profes. & kin.)

162. Purchasing Management

162.188 Purchase Price Analyst (profes. & kin.)

169. Administrative Specialties, n.e.c.

169.168 Cost Engineer, Retirements (light, heat, & power)
 Underwriter (insurance)

18 MANAGERIAL WORK, N.E.C.

186. Finance, Insurance, and Real Estate Management

186.288 Loan Officer (banking)

188. Public Administration Management

188.168 Assessor (gov. ser.)

19 MISCELLANEOUS PROFESSIONAL, TECHNICAL, AND MANAGERIAL WORK

191. Business Relations Work, n.e.c.

191.288 Appraiser (any ind.)

MANIPULATING

.884

Work Performed

Work activities in this group primarily involve the dextrous use of hands, handtools, or special devices to work, move, guide, or place objects or materials. There exists some latitude for judgment in selecting the appropriate tools, objects, or materials, and in determining work procedures and conformance to standards, although all these factors are fairly obvious. The work most frequently occurs away from a machine-oriented environment, and is prevalent in such endeavors as bench crafts, structural work, and hunting and fishing.

Worker Requirements

An occupationally significant combination of: Eye-hand coordination; manual and finger dexterity; spatial and form perception; a decided preference for working with the hands; the ability to work within prescribed standards and specifications; and facility in adapting to a routine.

Clues for Relating Applicants and Requirements

Success in craft courses in school.
Hobby of making scale-model boats and airplanes.
Expressed preference for working with the hands.
Hobbies of hunting and fishing.

Training and Methods of Entry

Apprenticeship programs and on-the-job training are the usual means by which a worker becomes familiar with his job. On occasions, experience in a lesser capacity can prepare an applicant for entry into this type of work, provided he has shown diligence and the capacity for more involved tasks.

Individuals with some exposure to disciplined and standardized work methods in a school or related environment will usually be given preference.

RELATED CLASSIFICATIONS

Craftsmanship and Related Work (.281; .381) p. 312
Tending (.885) p. 447
Feeding-Offbearing (.886) p. 356
Handling (.887) p. 360

QUALIFICATIONS PROFILE

GED: 2 3
SVP: 3 4 5 2 6

Apt:	GVN	SPQ	KFM	EC
	344	435	333	55
	4 5	344	444	44
				3

Int: 9 3 1 0
Temp: 2 Y
Phys. Dem: S L M H 2 3 4 6

107

20 **STENOGRAPHY, TYPING, FILING, AND RELATED WORK**
207. **Duplicating-Machine Work**
207.884 Duplicating-Machine Operator (clerical) I
22 **MATERIAL AND PRODUCTION RECORDING**
223. **Stock Checking and Related Work**
223.884 Sample Worker (any ind.)
229. **Material and Production Recording, n.e.c.**
229.884 Chart Changer (clerical)
24 **MISCELLANEOUS CLERICAL WORK**
240. **Collecting**
240.884 Parking-Meter Collector (gov. ser.)
29 **MISCELLANEOUS MERCHANDISING WORK**
298. **Display Work**
298.884 Advertising Display Rotator (bus. ser.)
299. **Miscellaneous Merchandising Work, n.e.c.**
299.884 Drapery Hanger (ret. tr.)
Optician, Dispensing (ret. tr.)
31 **FOOD AND BEVERAGE PREPARATION AND SERVICE**
313. **Cooking, Large Hotels and Restaurants**
313.884 Baker Helper (hotel & rest.)
316. **Meatcutting, Except in Slaughtering and Packing Houses**
316.884 Butcher, Chicken and Fish (hotel & rest.)
Deli Cutter-Slicer (ret. tr.)
Meat Cutter (ret. tr.; whole. tr.)
Meat-Cutter Apprentice (ret. tr.; whole. tr.)
317. **Miscellaneous Food and Beverage Preparation**
317.884 Coffee Man (hotel & rest.)
Pantryman (hotel & rest.)
Pantryman (water trans.)
Sandwich Man (hotel & rest.)
319. **Food and Beverage Preparation and Service n.e.c.**
319.884 Food Assembler, Commissary Kitchen (hotel & rest.)
36 **APPAREL AND FURNISHINGS SERVICES**
361. **Laundering Service**
361.884 Laundryman, Hand (laund.)
Laundryman (any ind.) I
362. **Dry Cleaning Service**
362.884 Dry Cleaner, Hand (clean., dye., & press.)
Fur Cleaner (clean., dye., & press.)
Fur Cleaner, Hand (clean., dye., & press.)
Furniture Cleaner (clean., dye., & press.)
Leather Cleaner (clean., dye., & press.)
Spotter (laund.)
363. **Pressing Service**
363.884 Blocker (clean., dye., & press.)
Hat Blocker (clean., dye., & press.)
Ironer, Coronets (laund.)
Presser, Hand (any ind.)
364. **Dyeing and Related Services**
364.884 Rug Dyer (clean., dye., & press.) II
Shoe Dyer (per. ser.)
Sprayer, Leather (clean., dye., & press.)
365. **Shoe and Luggage Repair and Related Services**
365.884 Shoe-Repairman Helper (per. ser.)
369. **Apparel and Furnishings Services, n.e.c.**
369.884 Fur Glazer (clean., dye., & press.)
Hatter (clean., dye., & press.)
Hatter Helper (clean., dye., & press.)
Laundry Operator (laund.)
Rug Cleaner, Hand (clean., dye., & press.)
Umbrella Repairman (any ind.)
37 **PROTECTIVE SERVICES**
373. **Fire Protection Service**
373.884 Fire Fighter (any ind.)
Fire Fighter, Crash (air trans.)
379. **Protective Services, n.e.c.**
379.884 Skin Diver (any ind.)
Smoke Jumper (gov. ser.)
38 **BUILDING AND RELATED SERVICES**
382. **Janitorial Service**
382.884 Janitor (any ind.) I
389. **Building and Related Services, n.e.c.**
389.884 Exterminator (any ind.)
40 **PLANT FARMING**
401. **Grain Farming**
401.884 Farm Hand, Grain (agric.) I
Farm Hand, Rice (agric.)
404. **Fruit and Nut Farming**
404.884 Farm Hand, Citrus Fruit (agric.) II
Tree Pruner (agric.)
405 **Crop Specialty Farming**
405.884 Bean-Sprout Grower (agric.)
406. **Horticultural Specialty Work**
406.884 Laborer, Nursery (agric.)
407. **Gardening and Groundskeeping**
407.884 Grounds Keeper (any ind.)
Grounds Keeper, Sports (amuse. & rec.)
409. **Plant Farming, n.e.c.**
409.884 Sharecropper (agric.)
Tree-Surgeon Helper (agric.) I
41 **ANIMAL FARMING**
411. **Dairy Farming**
411.884 Farm Hand, Dairy (agric.) I
Farm Hand, Dairy (agric.) II
412. **Poultry Farming**
412.884 Caponizer (agric.)
Farm Hand, Poultry (agric.)
Poultry Tender (agric.)
Poultry Vaccinator (agric.)
413. **Livestock Farming**
413.884 Cow Puncher (agric.)
Drencher (agric.)
Farm Hand, Livestock (agric.)
Hazer (agric.)
Lamber (agric.)
Ranch Hand (agric.)
419. **Animal Farming, n.e.c.**
419.884 Animal Caretaker (agric.)
Farm Hand, Animal (agric.)
Farm Hand, Fox Farm (agric.)
Game-Farm Helper (hunt. & trap.)
Horse Breaker, Draft (agric.)
Horse Breaker, Saddle (agric.)
42 **MISCELLANEOUS FARMING AND RELATED WORK**
421. **General Farming**
421.884 Caretaker, Farm (agric.)
422. **Farm Irrigation**
422.884 Irrigator, Valve Pipe (agric.)
43 **FISHERY AND RELATED WORK**
431. **Net, Seine, and Trap Fishing**
431.884 Fisherman, Hoop Net (fish.)
Fisherman, Net (fish.)
Fisherman, Diver Net (fish.)
Fisherman, Haul, Drag, or Beach Seine (fish.)
Fisherman, Lampara Net (fish.)
Fisherman, Pound Net or Trap (fish.)
Fisherman, Purse Seine (fish.)
Fisherman, Reef Net (fish.)
Fisherman, Squaw Net (fish.)
Fisherman, Trammel Net (fish.)
Fisherman, Trawl Net (fish.)
Fisherman, Pot (fish.)
Fisherman, Terrapin (fish.)
Fisherman, Weir (fish.)
Striker (fish.)
432. **Line Fishing**
432.884 Fisherman, Line (fish.)
433. **Fishing, Miscellaneous Gear**
433.884 Fisherman, Abalone (fish.)
Fisherman, Spear (fish.)
435. **Whaling**
435.884 Flenser (fish.)
Gunner (fish.)
436. **Marine Life Cultivation and Related Work**
436.884 Crab Farmer (fish.)
Egg Picker (fish.)
Egg Stripper (fish.)
Hatchery Man (fish.)
Shellfish-Bed Man (fish.)
437. **Sponge and Seaweed Gathering**
437.884 Sponge Hooker (fish.)
439. **Fishery and Related Work, n.e.c.**
439.884 Fisherman, Diving (fish.)
Net Man (fish.)
Sealer (fish.)
44 **FORESTRY**
449. **Forestry, n.e.c.**
449.884 Tree Climber (forestry)
45 **HUNTING, TRAPPING, AND RELATED SERVICES**
451. **Hunting and Trapping**
451.884 Walrus Hunter (fish.)
46 **AGRICULTURAL SERVICES**
465. **Blight and Pest Control and Bindweed Eradication**
465.884 Fumigator, Orchard (agric.)
469. **Agricultural Services, n.e.c.**
469.884 Sheep Shearer (agric.)
50 **METAL PROCESSING**
500. **Electroplating**
500.884 Matrix-Bath Attendant (phonograph)
Matrix Plater (electroplating)
Matrix Worker (phonograph)
Plate Former (elec. equip.)
Plater (electronics)
Silver-Spray Man (phonograph)
Electroformer (electroplating)
502. **Melting, Pouring, Casting, and Related Work**
502.884 Blast-Furnace Keeper (iron & steel)
Lead Caster (elec. equip.)
Mill Helper (nonfer. metal alloys)
Mold Setter (elec. equip.)
Needle Leader (knit goods) II
Second Helper (iron & steel)
Steel Pourer (iron & steel)
Steel-Pourer Helper (iron & steel)
505. **Metal Spraying, Coating, and Related Work**
505.884 Case Preparer-and-Liner Operator (ordnance)
Electroless Plater (any ind.)
Enameler (plumb. supplies)
Metal Sprayer, Production (any ind.)
Solder Sprayer (any ind.)
509. **Metal Processing, n.e.c.**
509.884 Filament Dissolver (electronics)
Test Preparer (iron & steel; nonfer. metal alloys)
51 **ORE REFINING AND FOUNDRY WORK**
511. **Separating, Filtering, and Related Work**
511.884 Bottom-Precipitator Operator (ore dress., smelt., & refin.)
514. **Pouring and Casting**
514.884 Caster (ore dress., smelt., & refin.)
Cupola Tapper (found.)
Ingot Header (nonfer. metal alloys; ore dress., smelt., & refin.)
Ladle Man (ore dress., smelt., & refin.)
Pourer, Crucible (found.)
Pourer, Metal (found.)
Tapper (nonfer. metal alloys; ore dress., smelt., & refin.)
518. **Molding, Coremaking, and Related Work**
518.884 Coremaker, Pipe (found.)
Core Setter (found.) I
Mold Closer (found.)
Mold Maker (ore dress., smelt., & refin.)
Plaster Molder (found.) II
Wax-Pattern Assembler (found.)
Wax-Pattern Repairer (found.)
519. **Ore Refining and Foundry Work, n.e.c.**
519.884 Carnallite-Plant Operator (ore dress., smelt., & refin.)
Ladle Liner (found.)
Leaf Coverer (ore dress., smelt., & refin.)
Mold Dresser (ore dress., smelt., & refin.)
Pot Liner (ore dress., smelt., & refin.)
Sampleman (ore dress., smelt., & refin.)
Stopper Maker (iron & steel)
Tool Repairman (ore dress., smelt., & refin.)
52 **PROCESSING, FOOD AND RELATED PRODUCTS**
520. **Mixing, Compounding, Blending, Kneading, Shaping, and Related Work**
520.884 Almond-Paste Molder (confection.)
Bench Hand (bake. prod.)
Roller (confection.) I
521. **Separating, Crushing, Milling, Chopping, Grinding, and Related Work**
521.884 Brakeman (corn prod.)
Offal Man (slaught. & meat pack.)
522. **Culturing, Melting, Fermenting, Distilling, Saturating, Pickling, Aging, and Related Work**
522.884 Neutralizer Man (corn prod.)
Pickler (can. & preserv.)
524. **Coating, Icing, Decorating, and Related Work**
524.884 Decorator (bake. prod.; confection.)
Dipper, Hand (confection.)
Enrobing-Machine Corder (confection.)
Icer, Hand (bake prod.)
525. **Slaughtering, Breaking, Curing, and Related Work**
525.884 Boner, Meat (slaught. & meat pack.)
Butcher, Fish (can. & preserv.)
Carcass Splitter (slaught. & meat pack.)